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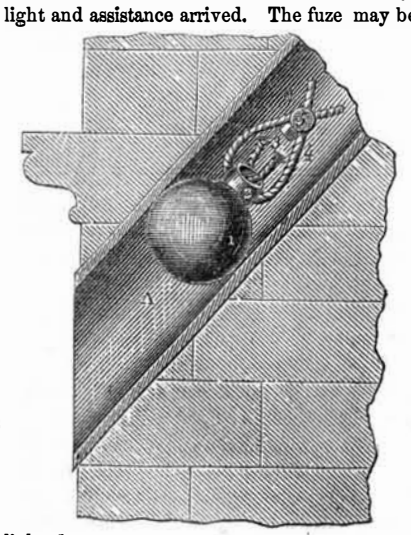
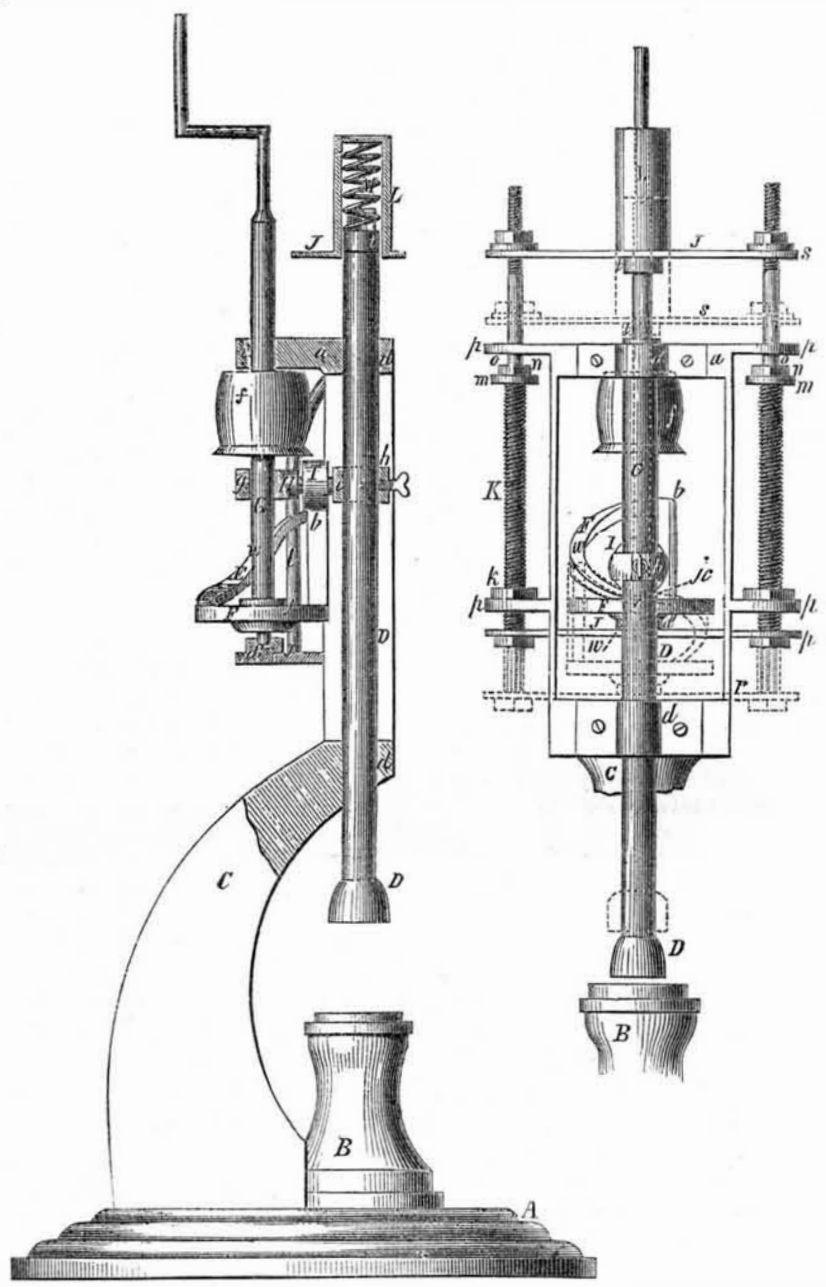
Capt. Norton's projectile.

After the late regetta at Cork, Captain Norton exhibited two of his projectiles in a boat in the deep part of the river, one being his submarine percussion petard as applied to the destruction of sharks. It was constructed of paper made waterproof, having a brick about four pounds weight attached to its lower end, to cause the ignition of the charge of powder by the sudden pull on the cord which held the upper part of the petard; the cord was of the length required for the depth the petard was to explode in, being six feet; the sudden pull of the weight attached, caused the percussion which ignited the charge, on the petard being allowed to fall into the water. This petard, in all its varieties can be adjusted (literally) on the hair or feather-spring guard. The other projectile was a paper hand-grenade, also waterproof, which exploded at the bottom of the deep water, by means of Pickford's safety fuze, primed at its upper end with a paste made of mealed gunpowder and spirits of wine. This was to demonstrate how fuze hand-grenades may be safely used for house defence. The annexed engraving represents this contrivance as hung *in situ*. A is an inclined tube, supposed to be fixed in the wall of a house, immediately over the door; 1 is a hand-grenade, fully charged, which is suspended by a loop of twine, 4, or fusible wire, passing through the cap, 5, of the fuze, from a nail, 5, fixed within the tube. The end, 3, of the quick-match being lighted, the twine or wire will be almost instantly consumed, when the grenade will descend by its own weight down the tube, into the midst of the storming party. Instead of one such grenade, there may be a whole battery placed overhead. The windows, too, may be protected in the same way as the doors; and a house so protected would be impregnable for the few hours which it would be necessary to stand out before daylight and assistance arrived. The fuze may be



lighted by a taper or port-fire; but Captain Norton recommends, as the simplest and readiest way, the application of a lucifer-match to the end of the quick-match, 3, in the same manner as lighting the wick of a candle. This may be effected also by pulling a wire, in the same manner as a bell-wire or cord is pulled. Houses protected by these means would each become a little fortress, and greatly disconcert an invading enemy.

PEER'S VERTICAL TRIP HAMMER.



The engraving herewith presented is an illustration of an improved Vertical Trip Hammer, patented on the 29th of November last, by John W. Peer, of Schenectady, N. Y. The engraving presents a front elevation, and vertical section. The same letters in each referring to corresponding parts.

The nature of this invention consists in raising and lowering the hammer by means of a screw cam arranged upon a circular plate secured on a revolving shaft and connected to the helve of the hammer by means of a horizontal lifting arm, which has one of its ends attached to the hammer by set screws, and its other end sliding freely up and down over the vertical cam shaft as the hammer rises and falls, said arm carrying a small friction roller, which as the cam shaft revolves turns freely and plays upon the top of the screw cam, preventing friction from the weight of the hammer upon the cam, as said hammer is raised gradually by the cam. The screw cam is arranged upon an adjustable frame, so that it may be adjusted to any desired position, and the length of the blow regulated, so that a full or partial blow may be obtained.

A is the platform of the machine, upon which is placed the anvil, B, and the standard, C, which supports the working mechanism. The upper part of C forms a box or guide for the shaft of the hammer to move in, the two vertical sides of this box being connected together at the top by the cross-piece, *a*, and at the bottom in the manner shown, the box and standard being cast in one piece; D is the hammer moving up and down in the guides, *d d*.

E the screw cam is secured on top and near the periphery of a circular plate, F, and extends more than half round it. The plate upon which it rests is secured fast on the revolving shaft, G. This cam forms a gradual incline in the line of a screw as seen in the engraving, its lowest end being almost on a plane with the top surface of the circular plate, while its highest end, *b*, is for hammers of ordinary size placed about ten inches above the end, *c*. The lower end of the shaft, G, of this cam rests in the step, *d'* of an adjustable frame hereafter described, and extending up passes through the ear, *e*, of the cross piece, *a*, and turns freely in it, carrying a driving pulley, *f*, by which it is set in motion through a band transmitting power from the engine or other mover. This shaft is connected to the hammer by the arm, H, in the manner shown in the drawing. This arm has two collars, *g h*, on it, the one *g* sliding freely over the shaft, G, as the hammer rises and falls, while the other, *h*, is fitted around and secured fast to the hammer shaft by a set screw or other device.

It is by thus securing this arm fast to the hammer and loose on the cam shaft, G, that the hammer can be elevated and depressed by the cam, E; I is a friction roller secured and turning loosely on the circular part, *i*, of the arm, H. This roller is so situated that it comes in contact with the top surface of the cam at the lowest point, *c*, as shown in the front elevation and then as the cam revolves, gradually comes in contact with the highest points of the screw cam, simultaneous with which the friction roller, its shaft, and the hammer, rise and assume the position shown in the vertical section. In this view the highest point, *b*, of the cam is shown resting under the friction roller, I, and ready to be moved from under it, which being done the hammer falls; the friction roller and arm falling into the open space, *j*, between the ends of the cam. The action of the cam from its peculiar shape causes but little concussion or jarring when it comes in contact with the friction roller.

J is the adjustable frame which supports or carries the cam and its shaft, it is made to move up and down on screws, K K, which move through holes in the ears, *p p*, *p' p'*, they being provided with nuts, *k k*, by which the upper movement is effected, the descent of the frame being caused by its weight simultaneously with the loosening of the nuts, *k k*; *l l* are braces having collars, *m m*, which fit round the screws, and are provided with nuts, *n*, to keep them in place. The smaller portions, *o o*, of screws, K, K, are made plain for a short distance, so as to slide through holes in the ears *p p*, of the stationary frame, as the adjustable frame rises and falls; L is a spring barrel holding the spring, *m*, for accelerating the downward movement of the hammer.

The implement recommends itself to all, and we hope it will be thoroughly tested by our mechanics. It is manufactured by Peer, Crane, & Co., Schenectady, N. Y., to whom all enquiries should be addressed.

(For the Scientific American.)

The Cycloid.

The curve described by a point in the circumference of a circle rolling on a plane is termed a cyloid. The determination of its properties is a problem of some difficulty, but of considerable importance both in a geometrical and practical point of view. It is the curve of swiftest descent, i. e. a body will fall from a given hight in less time on this than on an arc or inclined plane. Moreover bodies will fall from different hights on it in the same time. On this principle depends the doctrine of the pendulum. Its oscillations are isochronous only when it moves in a cycloidal path. It can be kept in this curve by making the rod adapt itself to two semi-cycloids; but this is not convenient in practice. And since the circle and cycloid do not coincide except in very small arcs, the vibrations, unless small, are not equal Hence, when accuracy is required, allowance must be made for this error. The difference between the times of oscillation in an arc of 36° and one infinitely small is 0·01675. When the oscillation is independent of its amplitude it is in the ratio of the square root of the length of the pendulum. From this theorem is derived the fact that the length of a second pendulum on the surface ot the earth is 39·11 in. This however is varied somewhat by difference of latitude, owing to the centrifugal force of the earth. The arches of bridges are sometimes cycloidal—the rise being equal to the diameter of the generating circle, and the span equal to its circumference. J. O.

New York Ship Building.

During the past year (1853)no less than 42 steamers of all sizes, were built in New York; the whole amount of new ships and steamers launched amounted to 60,500 tons. In 1852 it amounted to 51, 339; increase 9,161 tons. There are now on the stocks vessels, the estimated tonnage of which, amounts to 35,340 tons. New York is fast attaining to be the greatest steamship building port in the world.

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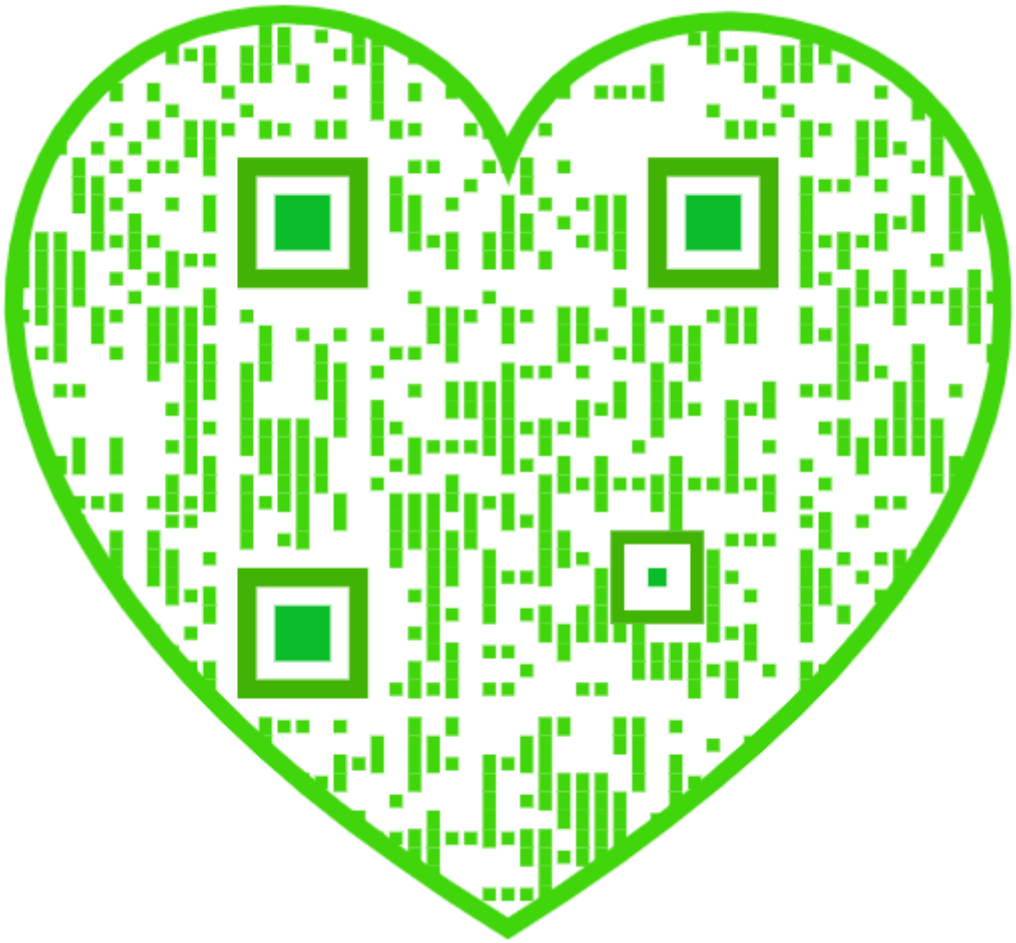

Imponderable Agents.---No. 6.

[Second Series.]

LIGHT, ELECTRICITY, AND HEAT.—A few years ago, Prof. Faraday read a paper which had long been anxiously looked for, before the Royal Society, in London, on the relationship of Light and Magnetism. In that paper he stated that for a long time he had been persuaded that among the several powers of Nature, producing different classes of effects, there existed an intimate relationship and that they were connected by a common origin, having a reciprocal dependence on one another, and capable, under certain conditions, of being converted into one another, but he was unsuccessful during a long course of experiments to detect any connection. At last he made the discovery that a ray of light may be electrified and magnetized, and that lines of magnetic force could also be rendered luminous. The fundamental experiment revealing such relationship between these two great departments of nature, is stated to be as follows:—A ray of light issuing from an argand lamp is first polarized in the horizontal plane by reflection from a glass mirror, and then made to pass for a certain space through glass, composed of silicated borate of lead; on its emergence from this it is received through an optical *eye-piece* capable of revolving on a horizontal axis, so as to interrupt the ray, or allow it to be transmitted alternately in the different phases of its revolution. The glass through which the ray passes, and which is *diamagnetic*, is placed between the two poles of a powerful electro-magnet, arranged in such a position that the line of magnetic force, resulting from their combined action, shall coincide with, or differ but little from the course of the ray, in its passage through the glass. It was found that when the eye-piece had been so turned as to render the ray invisible while a person was looking through, before the electric current had been established, it became visible whenever the circuit was completed, and instantly ceased to be visible when the electric current was interrupted. Further investigation also showed that the magnetic action caused the plane of polarization of the polarized ray of light to rotate. The direction of rotation was reversed, by reversing the poles of the magnet, hence Prof. Faraday concluded that a polarized ray of light was made to rotate in the same direction as currents of electricity. The rotary action was found to be always proportional to the intensity of the magnetic force; and also proportional to the length of that portion of the ray which receives the influence. Different media greatly differed in the degree in which they were capable of exerting the rotary power over a polarized ray of light. These experiments proved light to be magnetic.

Since Faraday made this discovery of the relationship of light and electricity, Prof. Forbes, has established the fact of the polarization of heat from dark sources, thus showing a relationship between light and heat. We cannot tell whether heat, light and electricity are separate substances, or one substance under different conditions, or the peculiar qualities of well known substances, developed under different conditions—some great discovery has yet to be made before we can determine positively any of these questions. We can only present and classify certain phenomena, and in doing this with light, heat and electricity, there is certainly such an intimate relationship exhibited, that any one who adopts the theory of the identity of these three powers—imponderables—has all practical science in his favor.

There is also a remarkable analogy between the action of heat and the undulatory theory of light. Heat acts in an undulating manner, and it has been established, that when heat is derived from luminous sources, there are two classes of waves. A body heated below red heat gives out long waves; when under high combustion and luminosity, it gives out, rays of all wave lengths. From the common action of heat however by conduction, we can easily be made to consider it a distinct substance, almost ponderable, for while we can admit heat from any source by a conducting medium into a box, or a room and retain it, we cannot do so with light. If a ray of light is admitted into a dark room by a small opening, no sooner is the outward source of light removed, than all traces of it vanish from the room also. But at the same time heat itself exhibits different qualities as it cannot be conveyed from one body to another, except by conductors, or by radiation, and by the latter method, it certainly exhibits an action very similar to that of light. Thus if a red hot cannon ball, be suspended in the air, rays of heat will be emitted from it as a centre, in radial lines which move with the velocity of light, and like luminous rays, may be reflected, absorbed, refracted and transmitted. By encountering certain surfaces, these rays may be reflected, or transmitted without disturbing the temperature of the reflecting or transmitting bodies. It is only when the rays of heat are absorbed, that an increase of heat in the absorbing body is the result. The conduction of heat, is always a slow process, while the transmission of radiant heat is almost instantaneous. Transmitted rays of heat do not heat the bodies through which they pass, as conducted heat does. The worst conductors of heat (air and the gases) are the best transmitters of heat rays, while the best conductors of heat (the metals) totally stop the progress of transmitted rays. The intensity of radiant heat diminishes in the ratio, of the squares of the distance from the radiating points; that is, the heating effect of any hot body, like the red hot ball mentioned, is nine times less at three feet distance thun at one foot, and sixteen times less at four feet than at one. This law applies to all influences from a centre, such as gravitation, light, electricity, magnetism and sound, and from it an argument may be drawn, for heat being a quality, like sound and gravity, and thus we meet difficulties at every step when we endeavour to account for these great influences of nature.

Recent Foreign Inventions.

SUBSTITUTE FOR GUTTA PERCHA AND PAPIER MACHE.—P. Warren, of Shodwell, England, patentee.—Straw, such as that of wheat or oats is cut into short pieces by a machine, and is then passed between crushing rollers, or it may be ground between stones with a little water to keep it moist. When well ground, so as to break up all its knots, it is boiled in an iron kettle in a strong solution of potash and soda lye until it is reduced to a soft mass; the time required to effect this depends greatly on the quality of the straw. After this it is placed in the common rag engine used in paper mills and reduced to pulp. After this it is partially dried, when it may be rolled into sheets or molded in molds. The sheets or the molded articles thus formed are then dipped into a solution of glue or oil, and they are afterwards baked in an oven similar to that employed in the manufacture of papier mache articles. Pigments may be introduced into the mass for giving it any color. The sheets or molded articles can be japanned, painted, and varnished, and the molded articles may be inlaid with shell, &c. This is simply the substitution of straw, for making papier mache, in place of paper.

ARTIFICIAL LEATHER.—Arnold James Cooley, of London, patentee—This patentee, takes gutta percha, gutta tuban, gutta gireck, or catimundi, or any of the substances having properties like those of such a hydro carbon as gutta percha, and reduces them to fragments by cutting, planing, rasping or grinding; he then heats them in an iron vessel, stirring them frequently until they are reduced to a soft dough. The dough so prepared, is then allowed to rest for some time without stirring, but the heat is kept up for about one hour. After some time, this mass separates into two parts, the impurest remaining at the bottom. The purest part is then taken out and heated in an iron pot or boiler for about half an hour at 250° Far. it being forcibly stirred all the time. It is then mixed with about 100 per cent. soda ash or any salt freely soluble in water and volatilizable by a moderate heat, to which is added about 15 per cent. of tar oil, or turpentine, or benzole, or resin, and the whole is kept stirred and heated in the same vessel at about 175° for 40 minutes longer. While it is still a doughy mass it is rolled into sheets of different thicknesses, to be used as a substitute for leather. The qualities of toughness and smoothness are obtained by the application of a high and long sustained temperature. The sheets of artificial leather so made, are after this exposed for a short time to the air, then steeped for 12 hours in vats containing water. After this, they are passed between smooth iron rolls, until they become soft and pliable, when they are again steeped twice in succession, in vats of clean water, the last water being slightly acidulated (moderately sour to the taste) with sulphuric acid. After this they are exposed to the air and dried, and afterwards, all the rough parts are polished down with pumice stone.

MANUFACTURE OF CANDLES.—F. Capiccioni of London, patentee. When the tallow for making the candles is melted in the kettle, about one seven thousandth of its quantity by weight, of the acetate of lead, is added, and well stirred among the whole for fifteen minutes The heat is then lowered, but the tallow is still retained in a liquid state. About one thousandth part by weight, of turpentine and a little of any of the perfumed resins, are then thrown in and all well stirred until the whole are thoroughly incorporated together; this takes about two hours, one hour for stirring, and one hour of rest for the uncombined impurities to settle to the bottom. The acetate of lead, it is said, makes the tallow hard and much superior to tallow not so treated; and upon the whole, the composition makes very superior candles.

GAS HEATING APPARATUS.—W. Bogget and G. B. Pettit, of London, patentees. This invention simply consists in the improvement of well known apparatus for burning common gas in combination with atmospheric air. The apparatus is covered at the top with fine wire gauze or perforated metal in the manner generally adopted for burning air and gas, but instead of using only one cylinder the patentees use several, arranged concentrically, and constituting several chambers of unequal depth, so arranged that the gas shall flow from shallow chambers into others which are adjoining.

MANUFACTURE OF FIRE KINDLERS.—George Marriott, of Hull, York, patentee. This composition is made by mixing 18lbs. of rosin oil, 48 lbs. of tar, which are boiled for two hours in an iron vessel to drive off the water; after this, 66 lbs. of resin are added and melted. This composition is mixed with charcoal dust, to a proper consistency and then made into neat cakes in moulds, and used for kindling fires rapidly.

PASTE FOR MAKING ORNAMENTAL WORK.—Henri J. Scoulten, of Mentz, France, patentee. This paste is composed of gutta percha, India rubber, pitch, resin, wax, gum-lac, oxyd of iron, sulphuret of antimony, chrome, and Zinc white, in equal quantities by weight. These ingredients are ground together in an iron vessel heated by steam, and when reduced to a homogenous mass, they are moulded into ornaments, for the borders of pictures, and cornices of any kind by placing any quantity of the mass, into proper moulds or dies to form the ornaments desired.

[Collated from our foreign cotemporaries, the "Mechanics' Magazine," "Newton's Journal," "Artisan," and "Mining Journal," London; "Genie Industriel," "L'Invention," and "La Lumiere," Paris, and the "Glasgow Mechanics' Journal.]

Writing Fluids.

[Abstract of a Lecture on the "Chemistry of Writing Fluids," delivered before Bacon's Cincinnati Mercantile College, by Prof. Chas. W. Wright, and reported expressly for the Scientific American.]

Intensity, fluidity, permanence of color, and absence of corrosive properties, are the desirable qualities in a writing fluid, and can only be accomplished by proper manifestations and a strict attention to the purity of the ingredients and in its preparation.

Black Ink is the medium commonly used for the purpose of expressing thoughts and words permanently upon plane surfaces, as paper, parchment, &c., and is the one that we shall first consider in a chemical point of view.

The bases of black inks are the two salts of iron, known to chemists as the tannate of iron, and the gallate of iron, both of which are invariably found in black ink which contains vegetable astringents, as nut-galls, oak bark, &c. The iron salt should be wholly, or in parts peroxidized, as the proto salts of that metal have no colorizing effect upon tannic and gallic acids the best being a mixture of the protosulphate and persulphate of iron, which can be obtained by exposing green vitriol or copperas to the atmosphere for some time.

If the iron be in the condition of a per salt the ink is intensely black when first written with, but does not retain its depth of color, and is easily erased from paper. This is the case with the Japan ink which is made of copperas that has been highly peroxidized by roasting. When the proto and persulphate of iron are both employed in the preparation of ink, it is not of a deep black color when first written with, but speedily becomes so on exposure to the atmosphere, and this is the condition of the iron to be preferred as it is partly in solution and sinks into the substance of the paper, and is removed with difficulty. Ink prepared from nut galls, oak bark, and some other astringents is, when first made, of a bluish black color, while that in which catechu, kino, or green tea are used has a greenish tinge when first written with. Arnold's writing fluid which has such an extensive sale in this country, can be imitated by employing iron in the state of the protosulphate in place of a mixture of the two sulphates and coloring the solution with sulphate of indigo or soluble Prussian blue, and if a greenish tinge be desirable, it can be given by the addition of some yellow coloring matter to the solution of Prussian blue, or indigo. Ink prepared in this manner, soon loses its blue or greenish color, when the writing is exposed to the air, and, when well made, forms a beautiful flowing black ink.

Sugar and gum are used for thickening writing fluids and it is a little singular that two substances should be accidentally selected for this purpose that are identical in chemical composition, sugar and starch each having twelve equivalents of carbon, and hydrogen and oxygen in the proportion to form water, thus, C.12 H.11, O11.

When sugar is used, the ink flows more easily from the pen, but is liable to be transformed into vinegar, which will corrode steel-pens. Gnm is not so liable to become sour, and has the additional advantage of forming a varnish as it were, over the surface of the writing when it becomes dry, and in this mauner renders it less liable to be removed by mechanical means. Great care must be exercised in the use of gum, particularly when steel-pens are in use, as they require an easy flowing ink, and too great a quantity of that substance will render it thick and totally unfit for writing with.

Mouldiness is counteracted by the addition of a small quantity of the oil of cloves, creosote, or corrosive sublimate, the latter in small amount is probably more efficient than all others but it should be remembered that it is a deadly poison.

All inks containing tannic or gallic acids, can be bleached or removed by means of oxalic, citric, or phosphoric acids, or by any of the bleaching salts of chlorine; and ink-stains and iron mould can be removed in the same manner Faded writing can be restored by the use of a decoction of galls, or a muriatic acidulated solution of the yellow prussiate of potash.

Blue Ink is generally made by dissolving sulphate of indigo, or basic Prussian blue in water and thickening the solution with a little gum. Common Prussian blue is rendered soluble in water by the addition of muriatic or oxalic acids. Booth and Morfit give the following recipe for making soluble Prussian blue. "Dissolve in a solution of iodide of potassium, as much more iodine as it contains, and pour this solution into one of yellow prussiate of potash containing as much of the solid prussiate, as the whole amount of iodine. Soluble Prussian blue precipitates and iodide of potassium remains in solution. After filtering, the precipitate is dissolved in water, and forms a blue ink containing no free acid and therefore adapted to steel-pens. If the soluble blue be added to common black ink, (from galls), the result is a black ink which cannot be removed from paper without destroying it."

The next lecture will be devoted to indelible inks and paper.

Extensive beds of porcelain clay have been discovered near Alton, Ga.

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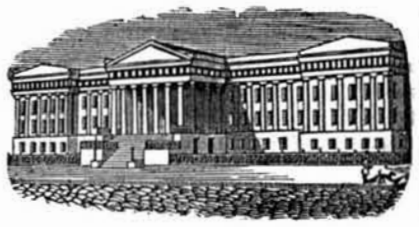

[Reported Officially for the Scientific American.]

LIST OF PATENT CLAIMS

Issued from the United States Patent Office

FOR THE WEEK ENDING JANUARY 3, 1854

QUARTZ PULVERIZER—By R. H. Collyer, of San Francisco, California: I claim the arrangement of the cylinder, curved basin, vibrating arm, connecting rod, and power wheel attached to it, by which arrangement the cylinder is operated as a pulverizer and triturator without a fixed shaft, as set forth.

[See engraving of this invention in No. 15, Vol. 9, Sci. Am.]

DOUBLE-ACTING SPRING HINGES—By T. F. Engelbrecht, of New York City: I claim the combination of the two independent spindles having right and left graduated slots in their sides, and against the stops of which the pins passing through the barrel of the hinge acts to operate alternately either of the springs attached to the spindles as the door is opened outwards or inwards with the barrel of the hinge, having flanges at opposite sides of the barrel, as set forth.

CORN SHELLERS—By Banford Gilbert, of Pittsburgh, Pa.: I do not claim as new the use of the feeding apron nor the use of a toothed cylinder, or screen, separately considered.

I claim constructing the teeth on the cylinder and concave bed of the peculiar form described and arranging the same in curved rows, so that during the revolution of the cylinder the concavity of the rows of teeth on the cylinder meets the concavity of the rows of teeth on the concave bed, in combination with the screen or separator and the self-adjusting concave, as set forth.

BREECH-LOADING FIRE-ARMS—By J. D. Greene, of Cambridge, Mass.: I am aware that fire-arms have been constructed in which the breech was forced up to its barrel by means of a screw cut upon its surface and working in a left-handed screw in the rear of the barrel, but as the breech is required to make several turns in order to advance it sufficiently to force it against the barrel, it was not practicable to adapt a lever to it for the purpose of operating it, which was effected by the thumb and finger, and required considerable time to accomplish it, The force that could therefore be brought to bear upon the breech was not sufficient to ensure a tight joint at its junction with the barrel, and the contrivance has failed to accomplish the desired end. I am also aware that Benjamin Chambers has obtained a patent for a movable breech secured to its barrel by means of a divided screw upon its advance, and working into a corresponding screw in the rear end of the barrel. I therefore claim neither of these devices, but an improvement on the invention of the said Chambers.

I claim the combination of the movable breech with the revolving chamber, when the two are connected together by means of the divided screws, in the manner set forth, the whole being constructed and operating as described.

MACHINES FOR NAILING WASHBOARDS—By J. B. Holmes, of Cincinnati, Ohio: I claim the use or application, as set forth, of a percussive force actuated by "power," to nail and clamp together the parts of a washboard, as set forth.

CORN PLANTERS—By Samuel Malone, of Tremont, Ill.: I claim the peculiar construction of the horizontal slide, made reversible from end to end for the purpose of varying the quantity of seed planted, as set forth.

RATCHET CATCH FOR HEAD BLOCKS IN SAW MILLS—By G. F. Page, of Baltimore, Md: I claim the combination of the latch, catch, and escapement pawl, as set forth.

CUTTING HAND RAILS—By Thos. Rogers, of Philadelphia, Pa.: I claim the combination of the self-adjustable cutters (reversible in motion, as described) with the jointed shaft and devices for driving the same, as set forth.

SEALING PRESERVE CANS—By H. C. Nicholson & James Spratt, of Cincinnati, Ohio: We claim the application to the aperture of a preserving vessel of a disc strip or pellet of gum elastic, or other pliant and air-tight substance, in combination with a wire, as described, or its equivalent, at the foot of the pump or tube through which the exhaust is made, whereby the said disc or pellet being temporarily confined in its range of motion performs the service of a valve during the exhaustion or escape of the atmospheric contents, and afterwards that of a stopper, and this we claim whether applied or not in connection, as described, with cement on the under surface of the disc, for the self-sealing thereof.

MACHINERY FOR SAWING LOGS—By Oren Stoddard, of Busti, N. Y.: I do not intend to limit myself to the sizes or proportions of the parts, as these may be varied to suit the size of log to be operated on, and the frame can be fitted to be taken apart for transportation, and can be set up in a forest and driven by horse-power, so as to prepare logs for the market directly on the spot.

I claim, first, the means set forth for elevating the saw when it has cut through the log by means of the ratchet, pawl, lever, and parts attached, in combination with the retaining latch, operated upon by the log, when it has been forced forward the required amount to disengage said latch, and allow the saw to operate on the log, as set forth.

Second, I claim forcing the log along the required amount for each section to be sawn off by means of the roller operated on by the lever and pawl, when said pawl is brought into action by the lever, as specified.

OPERATING CUT-OFF VALVE OF STEAM ENGINES—By Wm. Wright, of Hartford, Ct.: I do not limit myself to the use of the adjusting cams in connection with the fly ball governor, as the position of the shaft can be regulated by hand or by any other kind of governor.

Nor do I limit myself to the employment of my invention for operating puppet valves, as other valves, whether sliding or otherwise, may be operated by the same means.

Nor do I limit myself to the special construction of the parts, so long as the same end is attained.

I am aware that the cut-off valves of steam engines have been operated by cams made in a helical form to vary the period of closing by sliding the cam endwise, and therefore I do not claim the use of the shifting cam for this purpose.

But I claim the employment of the rotating concentric hub on which the toes, or their equivalents, of the lifter rest, when the valves are closed, as specified, when this is combined with a cam connected therewith, and which turns eccentrically thereon, for the purpose of opening and closing the valve and regulating the period of closing the same, as specified.

I also claim combining with the said hub and cam, a slide within them and acting on an oblique groove within the cam, and a straight slot in the hub, as specified, to determine the period of closing the valve whilst the period of opening remains the same, as specified, and this I claim whether the said slide be operated by a governor or by other means

RE-ISSUES.

UTILIZING SLAGS OF FURNACES—By Wm. H. Smith, of Philadelphia, Pa. Originally patented Dec. 7, 1852: I claim the process, as described, of producing ware from the slag or scoria elected from smelting furnaces for reducing iron, copper, zinc, and other metals, by separating them from and casting, moulding, blowing, or pressing the same in the heated state as it comes from the smelting furnace, and then annealing, whether additional heat be applied or not, as specified.

I also claim the method of obtaining slag or scoria from smelting furnaces in a vitrified state fit for remelting, to be worked into ware, as described, by casting it into thin sheets on to cold plates of metal or other good conducting substance, as specified.

LOOMS FOR WEAVING FIGURED FABRICS—By Cornelius W. Blanchard, of Clinton, Mass. Originally patented Aug. 3, 1852: I claim, first, the combination of the angularly moving catch bars, operated as described, with the shifting hooks hung on the jacks, so as to vibrate independently thereof, for the purpose of connecting and disconnecting the jacks with the said catch bars.

Second, the method described of combining and arranging the parts for turning the figuring chain or cylinder in either direction.

ADDITIONAL IMPROVEMENT.

BOG CUTTING CULTIVATORS—By E. L. Freeman, of Bellville, N. Y. Originally patented June 21, 1853: I claim the fastening of the tooth by matching the shank with iron having a head or flanges on it, whereby the action upon the wood is divided forward and downward by means of which the key and mortise are saved from wear and injury.

DESIGNS.

FRAME OF A FOOTSTOOL OR OTTOMAN—By Charles Zeuner (assignor to M. Greenwood & Co.,) of Cincinnati, Ohio. Two designs.

HALL STOVE—By Wm. Resor (assignor to Wm. & R. P. Resor & Co.) of Cincinnati, Ohio.

FOR THE WEEK ENDING JAN. 10, 1854.

OIL CUPS FOR STEAM ENGINES—By David Clark, of Philadelphia, Pa.: I claim constructing the oil cup as described, so that the flow of the oil from the chamber, A, into and from the chamber B, may be regulated wholly by the agency of steam and gravity, as set forth.

[This is a good invention, and is noticed on page 44 of this volume.]

PRESS FOR VENEERING—By Lucian A. & J. W. Brown, of Hartford, Conn.: We do not claim the method or process of setting or pressing a veneer down on a surface by the employment of the pressure of water exerted against a flexible material or caul, having the elasticity of vulcanized cautchouc nor the application of heat to such caul through such water.

But we claim, in veneering surfaces, the employment as set forth, of a thin metallic plate or caul, not only having the property of flexibility, but that of sufficient tenacity to take out the curls, as stated

We also claim the combination of a flexible metallic caul with a box having flexible sides.

We also claim the combination of the water through D and Flanch E, with flexible sides, and frames of posts, and the box B, the same being made to operate as stated.

COTTON GINS—By Leonard Campbell, of Columbus, Miss.: I do not claim the use of brushes suspended in a position so as to allow them to hang loosely between the ginning saws.

But I claim the concave brush ribs and concave brush in combination with the brush wheel, for the purpose of scouring the nap, which is formed by the ginning saws out of the cotton, and at the same time remove all impurities or foreign substances from it, said ribs are each of them provided with two rows of short stumpy bristles, which are secured on the inner edges of said ribs, as described.

I also claim the concave plate for the purpose of regulating the current of air which passes between said plate and wheel, as described.

[We noticed this invention on page 20 of this Volume Sci. Am. It is a good improvement.]

PREVENTING DUST FROM ENTERING RAILROAD CARS—By D. S. Darling, of Brooklyn, N. Y.: I claim arranging a series of deflectors along the sides of the locomotive, and entire train of cars in such a manner that a series of funnel shaped chambers will be formed, which run into each other, and form a continuous channel for the dust and air under the car to be confined in, while the funnel-shaped mouths at the front of the locomotive, receive a powerful outside pressure of air, which, by the position of the deflectors, is forced into less than its ordinary space, and causes an extraordinary suction current under the train, which concentrates and carries the dust, arising from the wheels, with it into the artificial channel under the cars, and confines it until it escapes at the end of the train. The open mouths of the deflectors on the sides of the cars also serving as channels for any side dust which may come in contact with them, to be sucked through into the central channel, as described.

I also claim the manner described of reversing the deflectors, so that they will effect the desired object, in whatever direction the train is going, as specified.

[See notice of this invention on page 108, this Vol. Sci. Am.]

MACHINERY FOR MORTISING FRAMES FOR WINDOW BLINDS—By D. M. Cummings, of North Enfield, N. H.: I claim the movable platform, spacing gauge, and oblique ways, when combined and arranged with each other and with the adjustable gauge bits, or their equivalents, in such a manner that the mortice formed will be exactly equi-distant from each other, and also in such a manner that any desired degree of inclination may be given to the said mortices, as set forth Disclaiming the use of the said movable platform, save when employed in combination with the said spacing gauge and oblique ways, as set forth

CLAMPS FOR HOLDING STEEL PLATES WHILE BEING HARDENED AND TEMPERED—By C. W. Fillmore, of Coral, Ill.: I claim making the ribs wedge-shaped, thick exteriorly, and thin at the edge where they come in contact with the plate undergoing hardening.

ATTACHING CROSS-BAR FASTENINGS TO VAULT AND SAFE DOORS—By F. C Goffin, of New York City: I claim the described groove and cross bar, as set forth, in combination with the doors designed to be fortified and secured thereby.

[This is a good device for the purpose, and is noticed on page 60, Vol. 8.]

COTTON GINS—By B. D. Gullett, of Aberdeen, Miss.: I am aware that brushes have been so arranged in gins that their bristles extend between the saws, but in such a manner that the sides of the bristles would act against the fiber, therefore I make no claim to any arrangement of bristles acting in that manner, my invention being confined to such an arrangement of the brushes that their bristles will act endwise against the fiber, in which position they are found to brush out the motes with much better effect than in any other.

I claim the combination of the mote brushes, operating as described, with the saw and stripping brushes, as specified.

MACHINE FOR PEGGING BOOTS AND SHOES—By Halvor Halvorson, of Hartford, Ct.: I claim the automatic combination, constituting the same, and composed of the following elements or their mechanical equivalents: —

First, a frame or boot holder.

Second, machinery for moving the boot holder horizontally in directions both towards and away from the awls or hole-making contrivances, or in accordance with the horizontal or peripheral curvature of the sole, such mechanism being the guide, bearing point or tracer and rurn spring.

Third, machinery for raising and depressing such boot holder in accordance with the vertical curvature of the sole, such mechanism being the guide or cam, and the second frame with its tracer.

Fourth, mechanism to give the boot its movement from heel to toe, or vice versa, under the awls or pricking machinery, such mechanism being the screw cogged wheel, pawl, lever, connecting rod, and crank pin on a shaft.

Fifth, machinery for holding the strip or strips of wood from which the pegs are to be cut, and regularly advancing such strips, in manner required towards the cutters, the same consisting of the troughs, and slide or carriage, arranged as described.

Sixth, a series of cutter knives, so made to operate as to cut from the peg strip, pegs: as explained, and hold or retain the same by friction between them and move such pegs forward to, and directly over the holes in the sole previously made by the awls or pricking machinery.

Seventh, machinery for pricking the holes in the sole for the reception of the pegs.

Eighth, machinery for pressing or forcing such pegs into these holes, such being accomplished by the plate, carried and forced down by the punch.

Ninth, a rocker frame or swinging lathe, made to support and carry the mechanism, above denoted as the fifth, sixth, seventh, and eighth, elements of combination.

Tenth, machinery for giving or imparting to such rocker frame its proper movement to ensure the correct direction of the awls in puncturing any hole or holes in any part of the sole, such machinery being the movable guide and the tracer, the latter being attached to the rocker frames.

And as auxiliary to the above, or as an improvement, I claim the reversible plate or awl holder, made capable of being turned around, as stated.

I also claim the improvement of so arranging, as described, the awls and machinery that cuts the pegs from the strips of wood, and brings them forward and forces them into the holes, that there shall always be one or more holes made in the sole between the pegs that are being driven and the holes that are being simultaneously made in the sole.

HEATERS FOR SMOOTHING IRONS—By J. J. Johnson, of Allegheny City, Pa.: I claim the raised body, for the purposes described in its combinations with the heater, with the large central opening to fit the raised body, the raised body, the outer shell of the box iron and the heater being adapted in shape and depth the one to the other, as described.

SELF-HEATING SMOOTHING IRONS—By John Johnson, of Alleghany City, Pa.: I do not claim the chimney, wooden handle, and the fastening for the top, &c.; neither do I claim in general the use of a distributing flue over the bottom of the iron, as that device has been used before in the self-heating flat-iron of Taliaferro & Cummings, patented March 30, 1852.

But I claim flues around the edge of the bottom, as described, in connection with the convexity of the upper part of the bottom of the iron, for the purpose mentioned.

MACHINES FOR SQUEEZING AND COMPRESSING METALLIC BODIES—By E. A. Lester, of Boston, Mass.: I claim giving to the hammer or compressor a positive reciprocating motion by means of the toggle-joint having a movable fulcrum to let down the hammer as the substance acted upon is being reduced, as described, when this is combined with the bed composed of rollers or the equivalent thereof, to hold and turn the ball or other body for the repeated actions of the hammer, as set forth.

FLEXIBLE CORDAGE—By H. H. Matteson, of Buffalo, N. Y.: I lay no claim to the making of cables or cordage of wire, but I claim the method of making flexible cordage impervious to moisture, and that will not shrink or stretch by use or exposure, by forming the body or core shreds of whalebone, bamboo, or rattan, covered by a water-proof coating, and the whole completely covered by plaited thread, as described.

CUTTING ELLIPSES—By Wm. G. Merrell, of Auburn, N. Y.: I claim the manner in which the driving pulley and cutter stock is made to rotate firmly on the trammel plate, viz., having the ways on the upper surface of the trammel plate, and a circular ledge or projection on the under surface, and causing the pulley and cutter stock to press firmly against the ways and ledge or projection by means of the pins or screws or nuts, as described.

[An engraving of this useful invention is published in No. 17, this Vol.]

MATTING THE ENDS OF BLOCKS IN MAKING MATCHES.—H. E. Pierce, of Charlemont, Mass.: I claim matting the ends of match blocks by means of rollers for the purpose as set forth.

I do not confine myself to the precise arrangements of the parts described, but shall vary them at pleasure, while I attain the same ends by means substantially the same.

GOLD SEPARATOR.—By David Pierce, of Woodstock, Vt. I claim the gold separating cylinder, with the stepped inclined interior surface and valve opening, constructed and operating as described, or any other mode which will produce the intended effect.

SAW GUMMERS—By J. P. Spofford, of Brocket's Bridge, N. Y.: I claim the combination of the cutter and collar, with recesses, so as to change the cutter when the teeth become dull from use, on one to the other part, where they are sharp, and thus make it perform double service, as described.

FLOAT VALVE FOR DISCHARGING CONDENSED WATER—By C. C. Walworth, of Boston, Mass.: I claim, in combination with the float, the outlet tube, the valve, I, and opening E, or the mechanical equivalents of said valve and opening; the second valve, B, and opening, F, or their equivalents, so arranged and applied to the tube and vessel or float as to operate to counteract the pressure on the other, or valve, I, under circumstances, as specified.

VALVES AND VAVLE SEATS FOR STEAM ENGINES——By S. D. Wilson, of Reading, Pa.: I claim the enlargement and peculiar construction of the steam ports in the valve seats of steam engines, and in adapting the valve to these ports so as to exhaust the steam, using for that purpose the aforesaid shape and figure, or any other which will produce the intended effect. I hereby disclaim title to any original invention of the slide valve, valve seat, steam ports, eccentric motion, and any else heretofore known, on which my improvement may be founded, confining my claim to the improvements made on them.

BEDSTEADS—By J. H. Barth, of Indianapolis, Ind.: I claim the notched cheeks, in combination with the shank and catch, as described, for fastening the posts to the inner frame, by inserting the shank between the cheeks, as set forth, and giving the post a vertical position, and also causing the speedy disconnection of the same by the inward inclination of the foot of the post, as specified.

TORCH LAMPS—By Harvey Brewer, of East Boston, Mass.: I am aware that torches have been adapted to cylindrical reservoirs containing burning fluid, the handle of the torch or swab closing the mouth of the reservoir and extinguishing the fluid should it chance to be ignited by returning the torch while burning. I do not therefore claim such a device.

But I claim the peculiar construction of the reservoir for containing the camphene, that is to say, the combination of the exterior with the interior tube, for the purpose of preventing the liquid from being spilled should the lamp be overturned, while the reservoir is at all times open for the reception of the torch.

FILTERS—By Jno. Kedzie, of Rochester, N. Y.: I claim constructing a filter with an inverted jar or reservoir, having a detached perforated base or bottom of a concave form with a flanged or rim edge, having a slot, as set forth.

MORTISING CHISEL—By I. W. McGaffey, of Philadelphia, Pa.: I claim the construction of the chisel, as described viz, having two cutting lips inserted in a slot or recess in the lower end of a stock said lips working upon pins, which pass through the stock: the inner surfaces of the lips being constructed as shown, and having a tongue working between them, which tongue, when the chisel is raised, forces apart the cutting edges of the lips and throws out the chip from between the said lips, the cross bar of the tongue, when the chisel descends, throwing apart the upper portions of the lips, and closing the lower and cutting ends, the tongue being raised between the lips by means of the spring or its equivalent.

[This useful tool is noticed on page 372, Vol. 8, Sci. Am.]

MORTISING MACHINES—By H. B. Smith, of Lowell, Mass. I claim the described combination for reversing the chisel by power applied by friction, with band or otherwise, and stops operated so as to stop the chisel when reversed, as set forth.

MAGNETIC TOY CALLED THE MAGNETIC CUPID—By Jas. Swaim, of Philadelphia, Pa.: I claim the combination of the question blocks with adjustable holes, the sliding piece, the toothed wheel, the rotating bar magnet and the exterior cupid, as described.

FEATHERING PADDLE WHEELS.—By Thomas L. Jones. of Poughkeepsie, N. Y. (assignor, through Horace Dresser) to J. B. Jones, of New York City: I claim, in combination with the mode described, of maintaining the paddles in parallel planes by means of the suspension ring, making the wheel and paddles in two parts, with a space between for the reception of the suspension ring, as specified.

REISSUES.

STUFFING BOXES—By T. W. Allen & C. W. Noyes, of Greenbush, N. Y. Originally patented Nov. 6, 1847: We claim combining with a stationary stuffing or packing box, a cup or ring, or its equivalent, through which the piston rod or shaft passes and works, so fitted as described, that the end thereof shall make a close joint by means of end pressure at the bottom of the stuffing box and be free to slide thereon laterally, to follow the vibrations of the piston rod or shaft, as set forth.

And we also claim making the inner bore of the cup conical, in combination with the cut metallic rings fitted thereto, as described, so that by the application of end pressure the cut rings shall be forced into close contact with the periphery of the piston rod or shaft, and the end of the cup into close contact with the bottom of the box, as described, and thus effectually prevent the escape of steam, or other fluid, and at the same time permit the required lateral play, as set forth.

VALVES FOR GOVERNORS—By Junius & Alfred Judson, (assignor to Junius Judson), of Rochester, N. Y. Patented originally Nov. 5, 1850: We do not limit our claim to the special form of valve opening described, as the form may be greatly varied and yet act upon the principle specified, as constituting the chief characteristic of our invention.

Nor yet to limit ourselves to the form of the aperture or apertures, as the same end may be obtained on the same principle by the joint form of the opening or openings, and the valve governing the same.

Nor do we wish to limit our invention to the making of such governor valve with the aperture or opening thereof, on the principle specified, throughout the whole range of motion, as in many instances it may be advantageously employed with the said principle acting only on a part of its range of motion, where engines are employed under such circumstances that they will not be exposed to perturbations above or below a certain range.

But we do not wish to be understood as claiming broadly the making of the apertures of governor valves of capacities varying independently of the range of motion of the valve, as the well known throttle valve and valves with circular apertures have not a constant increase or decrease of capacity proportioned to the range of motion.

But we claim making the opening or openings controlled by the governor valves of steam engines, of gradually increasing capacity from the closed towards the open position, as specified.

And we also claim interposing a spring between the valve cover and the set screw, or its equivalent which determines or sets the position of the face of the valve to its seat, so that the tension of the said spring shall resist the pressure of the steam on the valve cover, and thereby produce an increased flow of steam to the cylinder, as specified.

We also claim the employment of the valve lever adjustable to the stem of the valve, in combination with a fixed indicator, as specified, for the purpose of setting the valve in any required position without opening the valve box, as set forth.

[In the above List of Claims, for the present week, six of the patents were obtained through the Scientific American Patent Agency.

Oil and Health.

Your paper mentions several cases of persons being restored to health on being employed in woolen machinery, they being supposed to derive benefit from the oil used in manufacturing the wool.

I have a young man in my employment who attends a sett of wool cards, on which we use cotton-seed oil for carding wool. His health was very bad 12 months since, so much so indeed that I was fearful that he could not stand the work. His health is now completely restored, and he is as stout as any hand in my employment. J. C. H.

Lenoir, N. C.

New Species of Rattlesnakes.

In the Journal of H. F. Aubrey, who headed an exploring expedition from the Tejon Pass, in California, to Albuquerque, New Mexico, one of the southernmost of the proposed routes for the Pacific Railroad, we find the following mention of a new species of rattlesnake, discovered by him near the great Colorado River. He says, "East of the river we encountered a great many rattlesnakes of an uncommonly large size. They seem to be a new species, as their tails are covered for some six inches from the point with alternate white and black rings of hair or bristles, about a quarter of an inch long."

Influence of Elevation upon Cholera.

It has been demonstrated in London that in elevated localities the ravages of cholera are much lighter than in those on a level with the water-courses; and that the ratio of mortality varies with the degree of elevation. If this be a general law, the highest stories should be used as sleeping apartments during the prevalence of cholera.

Jointing of Belts.

I would state that shoe pegs are successfully used here for jointing belts to stand the effects of water and oil. T. G.

Providence, R. I.

The total number of omnibuses in New York is 619. The total number of omnibuses last year was 651. The decrease in omnibuses this year is very slight—a note-worthy fact, in the face of the powerful competition from the railroads. The number of hackney-coaches licensed for last year was 668.

A pine tree was cut lately on the farm of Samuel Emerson, at Black River, N. H., which measured 14 feet in circumference at the butt, and 78 feet in length. It was probably over two hundred years old.

The New York Sixpenny Savings Bank was opened in July last, and since that time 2243 depositors have put in $53,963 79

The heat of the earth, below where the frost usually penetrates, averages a temperature of 48 degrees, or 16 degrees above freezing; this is the reason why springs do not freeze, and not because of any quality in spring water.

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New Inventions.

Mechanical Typographer.

R. S. Thomas, of Wilmington, N. C., has invented an improved Typographer, or a machine for printing directly upon paper, so that ideas may be put in print without being written and afterwards composed as in the ordinary manner. The invention consists in having a wheel, the axis of which is placed in permanent bearings, and having type attached to its periphery. Underneath this wheel there is a cylinder placed in a sliding frame, having the paper which receives the impression of the types wound around it. The type upon the wheel are inked by proper rollers, and both the wheel and the cylinder are operated by hand. A patent has been applied for.

Regulating Water Level in Steam Boilers.

Oliver Butler, of Richmond, Indiana, has made application for a patent upon an improved mode of regulating the water level in steam boilers, which consists in the addition to the ordinary force pump, of an escape pipe which leads from the feed pipe back to the suction pipe, and is furnished with a valve, which is controlled by a float in the boiler, in such a way that when the water in the boiler is at or below the desired level, the valve is closed, and all the feed water is thrown in the boiler, but if the water should rise above the desired level, the valve would be opened, and the surplus water would run back through the escape into the suction pipe.

Sash Fastening.

G. W. Smith, of Dunkirk, N. Y., has invented an improved fastener for window sashes, which consists in the arrangement of a thumb catch and friction block operated upon by separate springs. The friction block retains the sash at any desired height, while the thumb catch secures the sash when closed, so that it cannot be opened from the outside. The inventor has applied for a patent.

Paper Feeder.

H. Clark, of New Orleans, La., has made application for a patent upon an improvement in devices for feeding sheets of paper, (one at a time,) to printing presses, and other machines requiring a like feeding motion, which consists in detaching or loosening a sheet of paper from the sheets underneath it by giving said sheet a backward and forward motion previously to its being operated upon by feed or pressure rollers, or other devices for conveying to the press, thereby preventing the possibility of two or more sheets being fed to the press at the same time. It is an excellent invention—one of the best we have seen for this purpose.

Connecting Hubs with Axles.

W. M. Newcomb, of Eden, Vt., has applied for a patent upon an improved mode of connecting and disconnecting the hubs of carriages, &c., with their axles, which consists in a key hole formed in the side and near the end of the cap of the hub, and covered by a horizontal spring slide in combination with an open slot formed in the end of the hub and in the nut which secures the hub and axle together. This slide allows the key to be inserted without the necessity of taking off the cap when it is desired to disconnect the hub from the axle, and serves when they are connected, to close the key-hole and thereby exclude dust.

Foreign Patents.

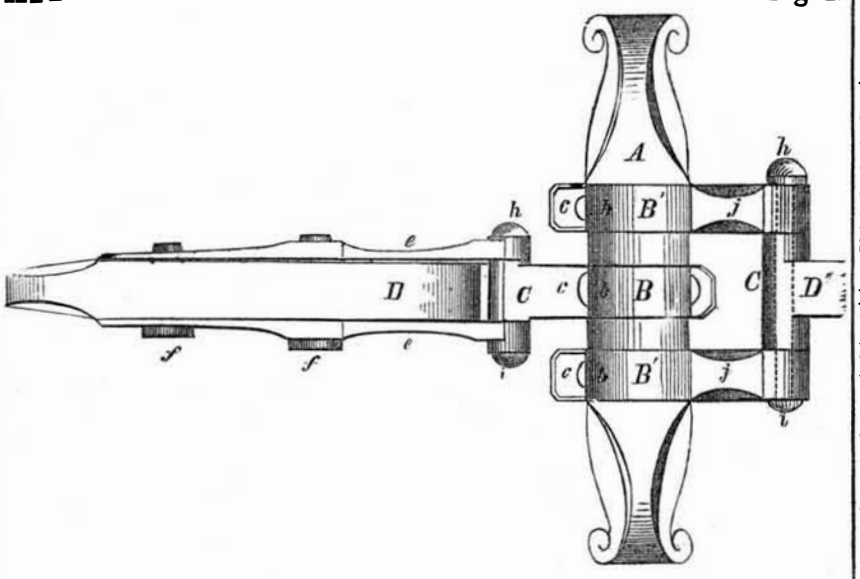
We received per steamer Baltic, English, French, Belgian and Holland patents belonging to the following parties. Calvin Carpenter Jr. Electric Engine, W. T. B. Milliken's Harvester. Bristol & Underwood's Rotary Engine. Henry Tanner, Flax process. R. Reynold's Jr. Power Loom. R. H. Tucker, Jr. Marine Vessels. W. M. Storm, Engine. James Wilson, Brick Machine. Beardslee & Crosby, Sawing Machine and Kinney's Drills. Our clients will oblige us by ordering their patents without delay.

The cotton crop in Texas has been a large one this season; there has also been a greater amount of sugar made in that State this year than ever before.

Joiner's Clamp.

N. F. Trogden, of Spencer, Tenn., has invented an improvement in clamps for joiners, cabinet makers, &c, which consist in having a driving rack, which is fitted between two plates, and a pinion gearing into the rack and operated by a lever, which is attached to it. The pinion works on a pivot, which passes through the center of a circular plate attached to one of the plates between which the rack is fitted.—The lever is provided with a spring catching into holes in the circular plate, thus securing the rack in the desired position. A patent has been applied for.

ATTACHING CARRIAGE SHAFTS TO THE AXLES.---Fig. 1.



Safford E. Sturtevant, of Hartford, Vt., has invented an improvement in the mode of attaching the shafts of vehicles to their axles, on which he received a patent Nov. 8, 1853, and of which the annexed eagravings are illustrations, Figure 1 being a plan view and figure 2 a transverse section of the axle. Similar letters of reference indicate corresponding parts.

The nature of this invention consists in securing the shafts of vehicles to the axles by means of an eye or collar having taper or conical ends which fit in adjustable sockets. The eye or collar may be attached to the shafts, and the sockets to the clasps which encompass the axle, or the collar may be attached to the clasps, and the sockets to the shafts. The ends of the eye or collar are secured firmly in the sockets by means of a bolt which passes longitudinally through the eye or collar, and also passes through the sockets. By means of a nut on the bolt the sockets may be brought nearer together and made to fit tightly against the ends of the eye or collar in case of its wearing loose.

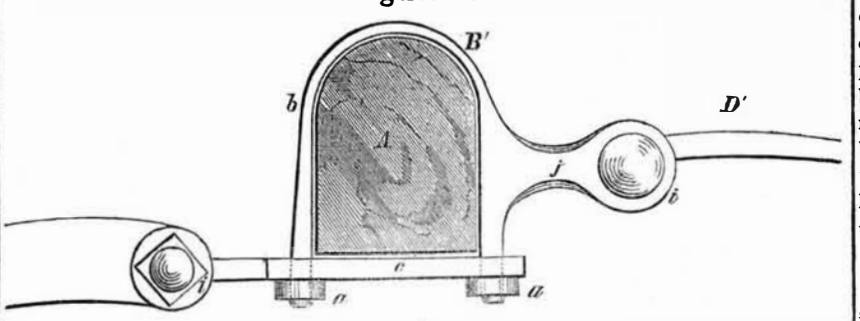
A represents an axle or a part of an axle of a vehicle, and B is a clasp which encompasses the axle and is secured to it by nuts, *a a*. The clasp is constructed in the ordinary way, being merely a bow, *b*, which fits over the axle, the lower ends of the bow passing through a plate, *c*; underneath the axle the nuts, *a*, being screwed on the lower ends, *b*, of the bow, and against the plate, *c*. To one end of this plate there is permanently attached an eye or collar, C, of cylindrical shape, having conical ends.

D is a section of a shaft having at one end two shanks, *e e*, attached or secured by bolts, *f f*, to its sides. The outer ends of these shanks have sockets or cavities, which receive the taper ends of the eye or collar, C. A screw bolt, *h*, passes through the eye or collar, and also through the center of the sockets, and by means of a nut, *i*, the sockets are made to fit tightly on the ends of the collar.

By this arrangement it may be seen that shafts may be firmly secured to the axle, there will be no unnecessary play or working in the sockets, and these in case of wear may be drawn tightly against the ends of the collar by turning the nut, *i*, on the end of the bolt.

The end of the shaft is cut taper or is beveled on its sides in order to allow the shanks, *e e*, to be drawn nearer together when the sockets

Figure 2.



require to be adjusted tightly to the ends of the collar. It is intended that the bolt, *h*, shall not receive or bear any of the draught; that is sustained entirely by the ends of the collar which fit in the sockets. The bolt is merely for the purpose of keeping the sockets tightly against the ends of the collar.

The shafts are detached from the axle by removing the bolts, *f f*, or unscrewing their nuts in order to allow the shanks, *e e*, and consequently the sockets to be spread apart sufficiently to allow the eye or collar to be removed from between them.

B′ B′ are two clasps constructed the same as the clasp, B, before described, with the exception of arms, *j j*, which project from them, and in which arms the sockets or cavities are placed; C is the eye or collar attached to the end of the shaft, D. This eye is fitted in the sockets in the same manner with the other. The sockets are adjusted to the ends of the collar by moving the clasps, B′ B′ upon the axle.

The claim is for securing the shafts of vehicles to axles by means of an eye or collar, C, having taper or conical ends which fit in adjustable sockets, the ends of the collar being kept firmly in the sockets by means of the screw bolt, *h*.

For further information address S. E. Sturtevant, Brooklyn, N. Y.

Door Strip.

D. A. & A. J. Haviland, of Princeton, Ill., have invented a new method of applying weather strips to doors, which consists in the peculiar mode of hanging the strip and arranging the saddle, whereby when the door is closed the strip is caused to drop and lap over the outside of the saddle, and is held up thereby while the door remains open.

Drying Starch.

J. M. Newcomb, of Eden, Vt., has made application for a patent upon an improved mode of drying starch, the nature of which consists in surrounding the inclined pipe leading from the blower to the heater with an inlet and discharge passage supplied with a continuous stream of water for the purpose of cooling said blow pipe, and consequently condensing the moisture of the air supplied before it passes to the drying chamber. The moisture as fast as it is condensed being caused by the inclination of the blow pipe to pass off through a branch pipe. A self-adjusting valve is supplied to the blow pipe.

Proportions of Vessels—Large Ships for Long Voyages.

In the last number of our cotemporary, the "London Mechanics Magazine," there is some very interesting information respecting large steamships and the proportions of their length and breadth. This was elicited in a discussion at a meeting of the London Institution of Civil Engineers, on a paper which had appeared in the "Edinburgh Journal," on "Ocean Steamers."

Length and Breadth.—One steamer in England named the "Wave Queen" had been built of proportions thirteen times longer than her breadth; it sailed very fast, and was found to be a good sea boat.

Large Ships.—The President of the Institution alluding to the large steamship of 10,000 tons which is proposed for construction, said, "the advantages of employing a smaller number of large ships rather than a greater number of small ships, for given trades, especially for long voyages, was beginning to be generally admitted by ship-owners. A paper was published in the "Liverpool Albion" of Nov. 21st, 1853, which presented the results of that experience in a remarkable form. The ships now employed in the American and British trade, had been greatly augmented in size, and with the best results; but these would be too small for the Australian trade. Every particular steady trade, no doubt, demanded peculiar vessels for that trade, and their size must be proportioned to the length of the voyage."—The conclusion of the discussion resulted in a general acquiescence of this principle.

Writing Pencil—Something to be Invented.

We have on two occasions, we think, directed attention to the importance of discovering a pencil which would write as easy and free as a good black lead one, and make clean jet-black marks—a pencil which would be a perfect substitute for pen and ink for common uses. We have often wished for such an instrument, for no class of men would be more benefitted by it than editors; we are therefore speaking a good word for ourselves, while we are jogging the genius of many of our readers. While traveling on railroad or steamboat, or on the highway, how convenient it would be when Shakespearean ideas flashed across the minds of some of our editorial brethren to pull out the jet black pencil and black-fossil them for ever. What barrels of ink such a pencil would save; how much dancing of the arm from paper to ink bottle it would obviate, in short, it would advance civilization, improve our literature, and last, but not least, make an independent fortune to the discoverer.

Tinning Iron Plates.

The most useful alloy of iron is that with tin, in tin plates. The surface of the iron plates is cleaned first, by steeping in a crude bran-vinegar, and then in dilute sulphuric acid; after which they are scoured bright with hemp and sand, and deposited in pure water, to prevent oxydation. Into a pot, containing equal parts of grain and block tin in a state of fusion, covered with tallow, the iron plates are immersed in a vertical direction, having been previously kept for about an hour in melted tallow. From 300 to 400 plates are tinned at a time; each parcel requires an hour and a half for mutual incorporation of the metals. After lifting out the tinned plates, the striæ are removed from their surfaces, and under edges, by subsequent immersion in melted tallow, wiping the surfaces at the same time with a hempen brush.

All the tin plate we use is imported from England; Wales monopolizes the tin plate manufacture of the world.

Cement for Bricks and Stones.

Sulphate of zinc and sulphate of iron, dissolved in water for slacking lime, makes it into a good cement.

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Scientific American.

NEW YORK, JANUARY 21, 1854.

Reform of the Patent Laws---Fees for Foreigners---Extension of Patents---The New Rule.

There is one feature in our Patent Law which it would afford us sincerepleasure to see abolished as soon as possible; we allude to the invidious distinction which it makes between the citizens of different foreign countries. Thus the citizens of all foreign countries are charged $300 each for a patent fee, with the exception of a subject of Great Britain, who is charged $500. We in a measure know how this distinction found its way into our present patent code, and we must tell those who find fault with our democracy on this point, that a native of Britain exercised his influence to get such a clause inserted, because, as was said, "the government of England charged such enormous patent fees." It is indeed true that the patent fees charged by the government of England previous to 1852 were enormously high, but then there was this much democracy about them, they were the same for all—Englishmen and foreigners—the domain of invention was looked upon as a republic of genius, and all inventors as its citizens. In this respect our patent laws are not democratic, and it is time that some honorable change was effected in them.

In No. 17, this volume, we published a letter from an Englishman, who justly complained of this feature in our Patent Laws, at the same time recommending the reduction of our patent fee to $100, for the citizens of all foreign nations. We also expressed a hope that Commissioner Mason would recommend the subject to Congress; his unquestioned ability to judge of what reforms in the Patent Law are necessary, being a sure guarantee on which Congress can place unlimited dependence. We have reason to believe that Judge Mason had previously given this question attention, and he will no doubt recommend such a reform as will be both politic and democratic. We consider that a fee of $100 is sufficiently high to prevent applications for patents on inventions having but a trifling amount of novelty and utility. One great fault in our patent laws as they relate to foreigners, is the retention of such an exorbitant amount of money for every rejected application; the amount to an Englishman being no less than $166 67 cts., for which he receives no benefit whatever. If the fee was reduced to $100 this evil would be greatly mitigated, and the fees retained for examination would still be large enough, although five times less than they are at present.

Improvement in science and art is one grand object for which we labor. We welcome the introduction of all new and useful inventions, let them come from whatever source they may, They enhance our country in all that conduces to its honor and power, and in all that relates to the welfare of our people. Without just and politic laws for the encouragement and remuneration of inventors, we are confident that civilization would be very low indeed; our railroads and steamships would be unknown, and the multifarious machines which we have to plow, reap, spin, weave, sew, and grind, and to accomplish a thousand different desires without a word of complaint, would not be in existence. We are therefore desirous of affording every encouragement to inventors, and of removing judiciously every feudal encumberance from our patent laws, which tend to retard the introduction of inventions in this country, and for these reasons we advocate the reduction of government fees to $100 for *all* foreigners.

Extension of Patents.—Some may suppose because we have opposed the extension of certain patents by acts of Congress that our professed friendship for inventors is not really in accordance with our acts; it is because we *are* friendly to inventors in general, and labor for the introduction of all new and useful improvements that we oppose such special grants. For example, an inventor makes a new and useful improvement to day, and secures a patent for it—the invention may be a good one—but another inventor looking upon the movements of this machine, may discover a method of rendering it fifty per cent. more effective. He also applies for a patent and secures one; but lo, he cannot use it without the consent of the first patentee, because it is only useful in combination with the parts of the previously patented machine. What is to be done? Ask the consent of the first patentee to use his machine? Yes. It is refused upon any consideration whatever, and the second inventor has to wait for nearly fourteen years before he can use his invention—the public all this time being excluded from its benefits—and then when he can do so his patent term is just about to expire. Although the first patentee may have made a great deal of money, it is quite natural for him to apply for an extension of his patent,—in fact, the more he has made, the greater exertion does he make to get his case extended. He does so, but his books show very satisfactory signs of a respectable compensation, and the Commissioner refuses to grant the extension. Not satisfied, he applies to Congress for a special grant of extension, because he knows such grants have been obtained before, and may be secured again. Would it be just in Congress to grant such an extension?—No; because it would keep out the improvement seven years longer from public use, and would operate unjustly against the inventor who made the *improvement*, and who by the common course of law could obtain an extension of his patent for seven years, in order that he might obtain some remuneration for his invention. It is thus that special acts of Congress in extending patents often do injury to inventors in general; they also tend to retard the progress of invention, and for this reason we oppose the extension of patents by Congress, in cases where patentees have been sufficiently remunerated. One patentee, under a democratic government like ours, has no more right to *special* privileges than another—all should be treated alike, and no invidious distinction made.

Rules of the Patent Office.—In deciding upon what shall be considered under one application and under one fee as constituting the subject of one patent, the rules of the Patent Office are for the present at least to be conducted in the *old way*—the new rule discussed by us in No. 15, present volume, having been *ruled* out by the Commissioner. No doubt many patents have been granted which have included two distinct inventions relating to two separate and distinct machines, such as the separate machines included in the Woodworth patent, one for planing boards, and the other for tongueing and grooving them; but in cases at law it is the duty of the Court to point out the boundary of the patent under litigation. According to the strict letter of the law no compound patent should be allowed to cover more than one machine, but a distinct part of a machine when patented is an invention in itself, and cannot be circumscribed by its connection with any one machine; and inventors and U. S. Courts should make this distinction. This last decision of the Commissioner will no doubt afford general satisfaction to our inventors. The conduct of Commissioner Mason, since he has held the Comissionership, has been characterised by an inherent desire to do justice to all, to promote the welfare of our inventors, and advance the arts and sciences for the benefit of our whole people.

Fires in our City—The Annihilator.

During the present winter our city has been visited with a great number of very destructive conflagrations; no less, we are confident, than five millions of dollars worth of property have been consumed by the devouring elements.—All this is a dead loss to the community, and may be considered as the total annihilation of fifty days toil of 100,000 men, at one dollar per day—an immense loss truly. What can be the reason for so many fires in our cities, and such extensive losses by them? There is surely something wrong and unwise in the manner of building our houses, or else there is a great carelessness in keeping "watch and ward" over property exposed to the danger of fire. As Americans we certainly exhibit a great lack of care and a great want of good judgment by permitting so much property to be continually passed away into the blue heavens above in a state of gas, after we have sowed it, reaped it, and fitted it for market, either to feed the needy in the shape of bread, or clothe the naked in the shape of cotton cloth; and it is surely as foolish to allow houses that have occupied hundreds of men for months to erect, to be consumed in a few minutes by the breath of the devouring element. All the labor performed on these must be re-performed to bring things back to their original condition, while the time lost can never be purchased at any price.—There can surely be some remedy found; better far to build more substantial structures, and exercise more watchfulness over them, than to be so reckless in doing so much in a hurry, and so careless in guarding what we have already gained. These conflagrations are great drawbacks on our prosperity and advancement.

Two years ago an invention was introduced into our city which the company who owned it declared "would put an end at once to all extensive conflagrations in our country;" that invention was "Phillips' Fire Annihilator. After examining the nature of this invention attentively, and witnessing several experiments with it, we charged those who had introduced it with having *claimed too much*, and that it was totally inefficient as an apparatus to effect any good, excepting it might be in confined rooms, and in the hulls of ships. Travelling lecturers interested in the invention denounced us for our out-spoken and candid views on the subject, and we were threatened with not a few fire-annihilating charges, all of which turned out to be just as effectual in acting upon *us*, and as favorable to themselves as their experiments in extinguishing prepared shanties, by allowing them to be burned down. If that invention had only one-fiftieth part of the good qualities claimed for it, surely we would not have been afflicted with so many fires this winter, as those to which we have alluded. We certainly gave it a better character than its exhibitors have shown it to have deserved, for while we stated that it might do good and be useful in many cases, we have not heard of a single good act performed by one of them in preventing or arresting a single fire. This much we have said in connection with this subject, in order to direct attention to only three points, which, if attended to, will be the means of saving much property from fires by preventing such calamities.

1st. Use less timber in our buildings.

2nd. Use more iron, both for walls and ornamental parts.

3rd. Employ more private watchmen in stores and public buildings.

We believe that if these three simple rules were carried out generally, we would not have one fire for ten that we now have. Insurance Companies are all very well in their way, but it would be far better for the community if they were not needed. Let our views be carried out, and there will be less necessity for them.

Curing Grass for Hay by Steam.

This is an age of bold innovations of old customs. We have one to propose which is worthy of the consideration of our State Agricultural Society, and now is the time to think about it, that premiums may be offered, or the matter at least discussed at the January meeting of the members and executive committee. It is to solve the question of curing grass for hay—that is discharging the water from it by steam instead of the slow, imperfect process of drying it in the sun, often, interrupted by rains, and the product injured or spoiled. Now, if saturating it with steam will have the effect, as we believe it will cure it, so that an hour of sun will dry it, or so that it may be preserved with salt, it opens a new era in the use of steam for agricultural purposes. The process need not be a very expensive or laborious one. Let the grass be heaped up as fast as cut and covered with India rubber cloth. Then a pipe from a steam boiler, mounted upon a wagon may be inserted under the center of the pile, and steam applied to a degree of heat strong enough to almost cook the whole heap; at any rate to prepare it for very rapid sun-drying.—[New York Tribune.]

[That grass can be cured rapidly by steam, is a fact well known to all who are acquainted with the progress of invention; and as stated above, it is only a question of economy between curing hay by solar influence, and that of steam. At present however, the economy is all on the one side—the old plan. We have seen corn, carrots, beets and many other vegetables dried by steam. The only proper way to dry hay by steam, would be to use it (the steam) at high pressure upon the hay, which should be confined in a close vessel, such as a large tight wooden vat having a safety valve and provided with a false bottom. The hay could be piled in at the top of this vat, then allowed to drop out at the bottom when fully steamed. But to cure one ton of hay would require a vessel of about 1000 cubic feet capacity. On a very large dairy farm where a steam engine is employed. and a large boiler is used—fuel being cheap—it might answer to erect such a vessel and thus employ steam for curing the hay.

On the other hand, some would prefer to employ a current of hot air, driving it through the hay by a blower, in place of the steam; this plan could be used on any farm, with a horse power to drive the blower—no steam boiler would be required, only a furnace with air tubes passing through it. Neither of these plans however, can be employed economically by our farmers in general; but the subject should not be overlooked by them; it will bear both investigation and experiment. We know that very many of our farmers lose a great deal of hay every year by imperfect curing; it heats in the mow and much of the very parts which contribute to sustain animal heat, passes off in a state of gas. Were we conducting a farm in extent from 80 acres and upwards, we would certainly employ a strong and simple steam engine of from 6 to ten horse power and would be sure to use a strong boiler of the most approved construction. In all parts of our country where coal is used by our agriculturists for fuel, a steam engine is easily worked, but by using wood for fuel, it is somewhat troublesome to feed the furnaces. A steam engine can be used to do all the churning, threshing, washing, sawing, shelling corn, grinding the flour and many other things beside. Indeed, we may yet see, one or two power looms in every farmer's house, for weaving all the plain cloth required by the family; they might also be very profitably employed for weaving blankets, for which there is a large market open, in all our large cities.

Currents of the Pacific.

On the 28th of October a small cask drifted ashore near Honolula, which was opened by a native and found to contain a tin box. In this tin box was a memorandum written in several languages, to the effect that the cask was thrown overboard from H. B. M. ship Rattlesnake, on the 20th of July 1853, latitude 21° 7′ N., longitude 151° 31′ W. It was requested that any one finding the case should forward it to the Admiralty, in England, in order that the currents might be determined which had floated the cask until picked up. It thus appears that the cask was just one hundred days afloat, and in that time had accomplished a distance west by north, of 360 miles, showing a current, including, however, the action of the winds, of three and a half miles every twenty four hours.

Presentation.

A number of employees on the Baltimore and Ohio Railroad have presented to William Parker, Esq., formerly superintendent of the road, at Barnum's Hotel, Cumberland, Md., an exquisitely chased silver tea service, and a valuable gold watch, as a tribute of their high regard. The tea set, which was wrought of solid silver and noted for its elaborate workmanship, cost $1,000, and the watch, which was really a beautiful article, cost $225.

Making bread too white may sound like an old phrase to the reader, yet we see by a late foreign letter that Messrs. Mounez & Chearel, two French chemists, who have superintended the provision of bread for the hospitals, and subjected all kinds to experiments, have submitted to the Academy of Sciences at Paris, a memoir, in which they condemn the practice, remarking that when too white it is a condiment and not an aliment. The exclusion of bran is a loss of nourishment to the consumer.

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PLAIN COTTON GOODS.—The exhibition of cotton cloth of American manufacture in the Crystal Palace has been a failure, so far as it relates to quantity and variety. We have no fault to find with that which has been exhibited, but the number of exhibitors, considering the number of cotton factories in our country has been few and far between; in fact, we believe that a better display can be found in any of the large warehouses in our city.

We have very little to say about the cotton cloth exhibited, it is all plain, but embraces a very extensive range of quality, from the coarse goods made out of No. 12 yarn, to that made out of No. 78. The finest cotton shirtings made in this State, if not the very finest made in our country, is that of New York Mills, B. Walcott & Co., near Utica, N. Y. These goods have a deservedly high character, and we understand that their merits are so well appreciated that the demand is always a step ahead of the supply. A very large and beautiful addition was made to the old factory during the last summer, so that the ability of the Company to supply the demand, will be greater hereafter. The cotton factory of Ida Mills, Troy, and one at Stillwater, N. Y., also manufacture beautiful fine cotton shirting. In the mass of cotton factories in this State, very few fine goods are manufactured.

Rhode Island stands high for her cotton manufactures; it is to America what Lancashire is to England; it was there where Samuel Slater opened the first American cotton factory. The Lonsdale and Hope Company, of Providence, R. I., exhibits a case of goods fit to compete in quality with any in the world. The pieces which we examined particularly were made of Nos. 70 × 78 yarns, 140 slaie, and 140 picks to the inch. The bleaching and finishing is excellent; in fact, they have an appearance almost equal to first rate linen goods. Some pieces of Nankeen from this factory are also very fine. The Williamsville Co., also exhibit some very excellent shirtings of extra twist. One case bleached at the Moshassuck Bleachery, Pawtucket, R. I., do not less credit to the bleachers than the manufacturers. Two cases of shirtings from Masonville Mills, bleached at Lowell, look well. One case of extra fine twist shirtings from the Wamsutta Steam Mills, New Bedford, Mass., is a credit to the factory.—About 50 pieces of plain cloth and drills from the Reading Manufacturing Co., Pa., confer honor on the makers. The Conestogo Steam Mills, of Lancaster, Pa., expose quite a number of pieces of coarse sheeting, some about two yards wide; some cotton blankets exhibited by this company look well.

Paterson, New Jersey, makes no display worthy of her manufacturing character; neither does the Patapsco factories, of Maryland, nor those of Lowell, with all their powers and advantages. It is indeed true that there is but little to show in plain cotton cloth, but then there are thousands who have visited the Crystal Palace, for other purposes than looking at the *gew-gaws*.

Cotton Duck.—We were pleased with the samples of American cotton sail cloth. There are five or six pieces of 78½ yards, made at East Haddam, Conn., and a few other pieces manufactured by Wright & Whitman, of Boston. We could detect no difference in the quality of duck manufactured by these two companies; both are good. The sails of the "Great Republic" were made of American cotton duck, and we notice that many of our new ships and schooners are rigged with cotton sails. It is said that the sailors like such sails better than those of linen duck. They are softer and more easily handled. During winter voyages in latitudes where the sails are liable to become icy and frozen, cotton duck is certainly far preferable to linen duck sails; they will not cut and crack like the linen, consequently they are more durable. Their first cost is less, and taking them for all in all they possess many advantages. Success to American cotton sails.

Report on Lubricating Oils in the Crystal Palace.

MESSRS. EDITORS.—I proposed through the columns of your paper last spring to "test the lubricating qualities of the different machinery oils," offered to the public, and to give those results publicity through the columns of the "Scientific American." Owing to the confused and hurried manner in which the mechanical department of our exhibition was opened, I failed to carry out fully the plans I proposed to adopt during that test, and I might do injustice by giving my opinions where only facts should be stated. Through mistakes of exhibitors, and others engaged about the building, two of the samples sent were nearly used before I was aware of it, and before I was prepared to take notes of the results. My impressions of what are termed manufactured oils, are certainly not very good, except perhaps for those offered by the Messrs. Devlin & Co., under Cumberland's patent, and by Dr. S. A. Main, of this city. The latter oil, claimed to be purely vegetable, and produced by distillation, has certainly great claims to public attention. I have subjected it to two months steady trial on the steam engines and upon the more exposed and heavily burthened shafting, and am fully prepared to say that the thirty gallons furnished us for trial, has shown a superiority in every essential quality for lubricating, over the best sperm oil we had been able to procure, and over any I had ever seen used in mechanical and manufacturing establishments. Of its cost to the manufacturer it is not for me to judge, but of its qualities I may, and I am free to announce to the public, that Dr. S. A. Main, of 29 Bond street, in this city, has furnished us with a quality of oil and grease superior to any now in use, and at a price only two-thirds the price of the best sperm oil and tallow at present so generally adopted. I expect to make further tests of oils with "Leonards Recording Dynamometer," and will give you the results in tabular form. Yours,

JOS. E. HOLMES,
Director of Machinery at the Crystal Palace.
January 2nd, 1854.

Experiments with Rotary Engines at the Crystal Palace.

On Saturday evening, Dec. 31, I again withdrew the fires from our boilers, and noted the results of the movements of our engines; Ebenezer Barrows' Rotary Engine having entered the list. This engine, which is 12 inches in diameter, with four pistons, each five inches long, by seven-eighths of an inch wide and seven-eighths thick, equals a reciprocating engine with a cylinder three and three-tenths inches in diameter, and seventeen and a half inches stroke. Accurate experiments with a most perfect dynamometer, showed that this engine moved the periphery of its belt pulley 1666 feet per minute, under a load of 120 pounds (equal to 6¼ horse-power) under 32 lbs. of steam. This engine is intended for 70 to 80 pounds of steam, and may safely be rated at a 12 horse engine. Its trial under a low pressure of steam (one lb. and less) showed a great freedom from friction, as it continued its motions some time after the other engines ceased to operate.

I give you these simple facts, allowing all parties to figure and judge for themselves of the true merit of this Rotary Engine.

JOSEPH E. HOLMES,
Director of Machinery.

Crystal Palace, New York, Jan. 9, 1854.

[This engine was illustrated in No. 4, Vol. 8, "Scientific American."

Governors of Engines.

MESSRS. EDITORS:—In condensing my Report upon the Trial of the Steam Engines at the Crystal Palace; published in No. 15 of your Journal, you led me into an error which called out the communication from Jno. F. Mascher, in this day's issue. A reference to the tables published in No. 17, will point out the error; please to rectify it by publishing the following correct statement of the "Results" and you will assure any calico-singer that he will not be interrupted in the midst of his operations by using a Steam Engine with Corliss' Cut-off attachment, under a pressure of Steam anywhere from 70 down to 7 pounds.

Erratum. "At 8 o'clock the running machinery was all detached, under a pressure of 7 lbs. of steam, which increased the speed of the Lawrence Engine two strokes above that noted 10 minutes previous under 10½ lbs. of steam. *At 8h. 30 m. under 1lb. of steam* both engines turning the long lines of shafting, belts, loose pulleys, &c.; the Corliss' Engine made 14 revolutions, the Lawrence Engine 10 per minute."

The above lines in italics, which you omitted has produced the false impression which its insertion now will make plain. The principal feature of the above trial is a fact as yet unparaleled in the annals of Engineering. JOSEPH E. HOLMES, director of machinery.

Crystal Palace, Jan. 14th. 1854.

Baker's Furnace at the Crystal Palace.

MESSRS. EDITORS:—Reading in your valuable paper several articles on Baker's patent furnace, I was surprised that the economical result of experiments with the *boilers* at the Crystal Palace, is wholly attributed to the use of this furnace; but a matter of greater surprise is, the apparently summary manner in which its comparative economy is arrived at. In these days of steam, it is of the greatest importance to the manufacturing community, as also to the young mechanic, that such alleged improvements as the above, should be practically tested in comparison with others, and with the old, upon a proper basis, and the result carefully and impartially set before them. Is it not necessary, in drawing a comparison between this and other furnaces, that much more should be known, than merely, that so much water was evaporated in a given time, by a given quantity of fuel? That 11·457 lbs. of water have been evaporated, at the Crystal Palace, by one lb. of coal, is, in itself, no proof of any peculiar economy in this furnace; may not the above result be attributed in part to other conditions employed, which are not common to boilers in general use? We are not informed but it is at least reasonable to suppose that to meet any exigency which might arise, a more ample supply of boiler has been furnished, at the Crystal Palace, for the power exerted, or rather, for the water evaporated, than is usual in ordinary cases;—if this were so, it would certainly effect a comparison. That an increase of heating surface is of no avail, except as it keeps the heated air longer in contact with the boiler, thereby imparting the heat more effectually to the water, or in other words evaporating *more water* is just what has been always claimed for it—and is not this, in the estimate worthy of consideration? There is another important feature which should not be lost sight of in such comparisons, viz—the pressure under which the water is evaporated;—it is plain that if in one case the evaporation takes place under a pressure of 20 lbs. per inch, and in another under 100 lbs. per inch, there will be at least 100 degrees of heat lost in the latter case, that would be available in the former. I would suggest that the following data should be required in estimating the value of furnace improvements, viz., weight of water evaporated; weight of coal consumed; temperature of feed water; pressure under which the evaporation takes place; generating surface employed; time occupied in the evaporation.

My object in writing this is, to lead to a proper investigation of the subject in question, so that the whole truth may be elicited and the public made fully aware of the true value of such improvements. W. B.

[One of the interrogations in the above is answered by this furnace, viz, "other conditions employed, not common to boilers in common use." It is owing to the peculiarity of this furnace that so much is claimed for it.—ED.

The entire works of the Reading Rail Road Co., at Reading, Pa., were consumed by fire on the night of the 8th inst. These works, in addition to the depot, consisted of a Repairing shop, Boiler shop, and Foundry. About 15 locomotives were more or less injured by the fire.

The Richmond papers notice fine specimens of coal and iron ore from Augusta Co., Va.

Awards of our Prizes.

We publish the following letters from parties drawing our prizes, they are all that we have received up to the time of going to press. The remaining will please draw on us for the amount due them soon as convenient.

MESSRS. MUNN & CO:—Yours of the 5th inst. came to hand in due time. Was sorry to learn that the list of fifteen names did not reach you in time for publication. I feel perfectly satisfied with your decision in regard to the prize of $20 for which you have my hearty thanks and future exertions to circulate your valuable Journal, which is to the mechanic what the compass is to the mariner. You will please send by mail, the amount you have awarded me and oblige,

CHARLES BURLEIGH.

Fitchburg, Jan. 10th. 1854.

MESSRS, MUNN & CO.—I received your communication, dated 30th. and was pleased with its import, but should have been much more so had the amount been greater. You will oblige me by sending me a check on Page & Bacon.

J. H. CHILDS..

St. Louis. Mo., Jan. 6th. 1854.

MESSRS. MUNN & CO.:—Much obliged to you for your prompt notification of my success as one of the competitors for your prize. I have drawn upon you for the amount. and permit me to say that I am well remunerated for all the time spent and labor performed in the canvass. When I commenced, it was with the view only of renewing the old Club. But I found by soliciting my brother mechanics that no persuasion was necessary. Many of them knew its reputation and desired an opportunity of the kind to obtain it; several came to me hearing that I was getting up a Club. Well about the time I had thirty subscribers, I began to feel that I might with a little exertion, win one of those prizes, and I now see that I could have done better still. In your published list of the numbers sent in by the twelve successful competitors, I see that I am credited with only 74, it should have been 80, for that is the number I sent you: you will please excuse my ambition but I am desirous of all the credit due me; you will at once see that I have no pecuniary motive in making this request, as it cannot alter or affect the awards already made.

NICHOLAS YOUNG.

Lancaster, Ohio, Jan. 6th. 1854.

MESSRS. MUNN & CO.—Your favor of the 30th ult, was duly received, informing me of my having been successful for the sixth prize offered by you. I have therefore drawn a draft this day on you payable to the order of Messrs. S. H. Ives & Co., for $35.

It was more than I expected, and therefore the more acceptable, and I trust that we have been mutually benefitted. Please accept my thanks for the New Years Gift.

T. P. ROBINSON.

Detroit, Mich., Jan. 9, 1854.

Lubricators for Rail Car Axles.

With regard to the heating of axles, Sir F. Head, in a report upon the Paris and Lyons line, observes:—

"On all our railways in England the respective companies, as well as the public, very constantly suffer expensive and troublesome delays from what are professionally called "hot axles," which sufficiently proves that the nice-looking yellow mixture which at almost every stoppage endeavors to prevent the evil is inadequate for the object for which it has been concocted.—Now, the French government, invoking the aid of chemistry, have scientifically ordained on the Paris and Lyons R. R. the use of 3 descriptions of anti-attritive ointment—namely, one for hot, one for frosty, and one for wet weather. I was assured by the engineer that the result has been most successful; and, as everybody who travels by rail in England would deprecate the idea of a human being using one sort of dress for every description of weather, so it sounds only reasonable that railway axles should not be ignorantly restricted to one single medicine, to be "taken when shaken," as a cure for the innumerable ills to which, under various temperatures, they are exposed.'

Wood is selling in Cincinnati at $7 per cord.

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TO CORRESPONDENTS.

E. G. R.. of Mass.—Many plans of hydraulic engines have been tried, but a steam engine is the only faithful motor for use.

N. W. R., of N. Y.—We cannot see how chilled iron can be softened without being heated to a low or deep red heat.

C. G. K., of Mo.—In our advertising columns you will find responsible concerns engaged in the manufacture of steam engines: we have none for sale. We do not know of any concern who are engaged in the manufacture of portable saw mills: Geo. Page & Co., of Baltimore, Md., have been and may still be engaged in the business;—you might address them.

G. M. P., of Me.—Your age is no objection to your securing a patent.

P. W., of Cal.—We can refer you to no good work on wind-mills: Hughes' "American Miller," published by H. C. Baird, is a good work for your use, We do not think the device you describe for cutting paper is patentable. A similar machine is in use. We thank you for your efforts to extend the circulation of our paper in the Golden State.

C. F. T., of Ky.—Your paper is regularly mailed from this office, and the fault is in transit; we cannot explain the cause in any other way.

C. G. C., of Ky.—We cannot furnish the information you desire in regard to Spanish cedar. Dexter & Bro., Ann street, this city, are reliable newspaper and periodical dealers.

W, G., of Va.—We have never seen india rubber covers used for fruit, meat, and other vessels, as you propose, but gutta percha is so used for covering corked bottles, as a substitute for leather. We believe a patent could not be obtained. Your other plan for preserving grain, meat. &c., is in its details new, and a patent might be obtained, but we have our doubts, because, in 1847, the plausibility of constructing iron ships, with air-tight apartments, the air to be exhausted by a steam engine, for carrying grain, was discussed in a number of the foreign scientific journals. Your communication will receive attention next week.

A. J. M., of N. Y.—We cannot see any advantage in using a hydrostatic and steam engine in combination, nor can any patent be obtained for such a combination; were it otherwise we should be happy to say so.

J. C., of N. J.—We have never heard of a plan for preventing car axles from breaking, like the one which you describe. We think it is new and patentable. Send us a model,

S. D. P., of Va.—Vulcanizing india rubber means the subjecting of it to a high heat, in its preparation flour of sulphur is mixed with the india rubber when in a state of dough, and when it is rolled out and made into goods, it is subjected to high steam heat, whereby the india rubber is changed in its nature, and rendered capable of resisting high temperatures—it is vulcanized.

A. G., of Md.—We would not use a brick roof for any furnace, but allow the flame to play directly on the boiler. We do not believe that much profit can accrue from the use of wet tan bark, and we are afraid that you could not get up a sufficient and constant supply of steam. By all means use your plan for keeping out the cold air while firing up.

J. A., of Mass.—We DO PLEASE to recommend to our correspondents just such inventions as we please, and do not care to have interested parties attempt to dictate what advice we shall give. For some purposes and under some circumstances your furnace may answer better than the one recommended in Vol. 7, but we must be permitted to discriminate under what ones, and in duty to our correspondents advise them accordingly.

J. S., of N. Y.—We certainly think a new motive power would be the greatest invention of the age, if it could be so successful as to supersede steam, but we do not know where you are going to find a field for exploration,—hot air, gas, ether, &c., have been quite well investigated already. We do not, however, discourage you, if you first inform yourself fully as to what has been already done, and as to the principles requisite for producing a successful motor. If you succeed you will be a great public benefactor.

N. R., of Wis.—You need not be surprised at the error referred to. Editors conducting political papers cannot be expected to understand mechanics or machinery.

L. T. R., of Mass.—The application of metal to wood could not be patented; any one has a right to use the two articles together.

L. W. N., of Mass.—The price of Scott's Engineering and Machinist Assistant is $24.

E. H., of Vt.—Patents have been issued for ice-freezing machines, but we do not now know of one in successful operation. At the London Crystal Palace the ice used was frozen in a machine. If your machine will do what you claim for it, it will be useful.

W. M., of Geo.—We do not think you can secure a patent for shrinking a car wheel while cooling on an extra piece of iron; we think this has been done by others.

J. H. C. of Mo.—For the amount due you as awarded we have sent you a draft upon Clark Dodge & Co., of your city.

S. D. H., of N. H.—There are machines in use for polishing marble. If you would wear a mask of wire gauze covered with coarse cotton cloth you would experience some relief. You can case-harden malleable iron, but half an inch in thickness is deeper hardening than any we have seen.

A. N. N., of Va.—Use three parts of chlorate of potash, one of sulphur, and one of niter, and you will make a good detonating powder. Grind each separately, then mix all with great care, by hand. Be careful and not expose yourself.

A P. R., of N. S.—Carburetted hydrogen costs $3 per 1000 cubic feet here. It requires about seven volumes of atmospheric air to one of carburetted hydrogen, or hydrogen itself, to render them explosive. No vessel could stand the pressure of the explosion. Your plan is not practicable.

J. F. H. of Ky.—If you consider the question about tides more carefully, you will come to the same conclusions as those we have expressed. We are obliged to you for your expression of feeling in reference to what we said about the Morse patent.

L, W. & Co., of Ohio.—We are not aware of sulphuric acid being used for the purpose in the manufacture you speak of, but we know chemically, that it will effect the object, although we cannot give you the quantity. On page 45 vol. 8 Sci. Am. you will see the mode of using it described.

S. W., of N. Y.—An active man working to the best advantage can raise ten pounds ten feet in a second for ten hours in a day.

J. E., of Wis.—Yours has come to hand.

C. S. of N. Y. Probably the reason why we did not answer your former letter, was because we had not time to examine so many inventions at one time. We never saw a sheep shearing machine, and have no doubt a patent might be obtained if it could be made serviceable for the purpose. You had better construct a thresh ing machine on the plan which you describe. It may be a good plan for aught we know to the contrary. We cannot tell whether a profitable patent could be secured or not on a hand cart mowing machine. We never before heard of such a machine.

N. P. of Ind. The description given of your water regulating device for boilers is too vague and indfinite for us to understand it fully. You had better send us a sketch and description of it for examination.

Benj. Nichols, of Natick, R. I. wishes to procure machines for knitting ribbed stockings. Will some of our readers inform him where he can obtain them?

J, H. McG., of O. When did you send your petition of withdrawal to the Patent Office? We have had no tidings of the $20 yet, from that source.

M, K, of Mass.—You will find some very excellent remarks in the laws of accoustics with respect to churches Halls, &c., in the works of Dr. Rush.

S, E. T. of Mis.—Heat your picks to a low red heat, and dip in cold water in which some salt has been dissolved,

M. B. of N. Y.—There is no question among inteligent engineers, about using steam expansively. When you have plenty of power, expand it, to be sure. Cut off just as soon as you can, according to your work. Try your engine, after it has made three fourths of the stroke.

J. B. of N. Y.—You will please call at our office in regard to the railroad brake, and we will give you our opinion.

Thos. Mc Clure, formerly of Mc Connellsville, O.—will oblige us by sending his address to this office.

N. Y. of O.—Your draft was paid on presentation.

C. B. of Ms.—We have sent you $20 in bills by mail agreeable to your request.

Money received on account of Patent Office business for the week ending Saturday, Jan. 14:—

J. M. T., of N. Y., $60; P. M., of N. Y., $30; H. G. B., of Mich., $30; D. A. H., of N. Y., $110; J. C. R., of N.Y.; $100; T. & A., of N. Y., $30; G. W. F., of Ohio, $20; T. B. S., of N. J., $50; H. T., of N. Y., $20; H. B., of O., $30; R. S., of N. Y., $30: W. H. S., of N. Y., $30; S. U. & W. F. S., of N. Y., $30: J. L. & D. J. R., of N. Y., $55; B. V. B., of N. Y., $20: W. W., of S. C., $30; E. J. B.. of Mo. $25; J. V. S., of Ohio. $30; J. P. H.. of Phila., $72; F. L., of N. Y., $30; M. & B., of N. Y., $30; E. L. S., & Co., of Mass., $7; J. R., of Ct., $30: C. W.. of Ct., $30; N. W. R., of N. Y., $30: S. M. & J. S., of N. Y., $30: J. E., of N. Y., $50; W. B., of N. Y., $55.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, Jan. 14:—

W. B., of N. Y.; J. C., of N. Y.; G. L. W., of Md.; J. O. of N. Y.; W. G. H., of Pa.; J. L. B., of Mo.; B. V. B., of N. Y.; J. H. H. B., of N. Y.; J. P. H., of Pa.

LITERARY NOTICES.

THE MINING MAGAZINE—For January, has come to hand: this is one of the best of our exchanges. It is always readable and interesting, and is devoted, as its name implies, to the Mining Interest. Published monthly, in New York City, by Wm. J. Tenney, 142 Fulton st., at $5 per annum.

No. 5, Vol. 2, of the "Book of the World" has been received; it contains a beautiful copper plate engraving of Mount St. Bernard, besides several other illustrations. Weik & Wieck, publishers. Phila.

Another number of the "Industry of All Nations," G. P. Putnam & Co., has been received; the illustrations are, if possible, better than those in the preceding numbers. This work deserves an extensive circulation. Another quadruple number will complete the series.

A Chapter of Suggestions, &c

PATENT LAWS, AND GUIDE TO INVENTORS—We publish and have for sale, the Patent Laws of the United States—the pamphlet contains not only the laws but all information touching the rules and regulations of the Patent office. Price 12 1-2 cents per copy.

RECEIPTS—When money is paid at the office for subscriptions, a receipt for it will always be given, but when subscribers remit their money by mail, they may consider the arrival of the first paper a bonafide acknowledgment of the receipt of their funds.

BACK NUMBERS AND VOLUMES—In reply to many interrogatories as to what back numbers and volumes of the Scientific American can be furnished, we make the following statement: Of Vols. 1, 2, 3, and 4—none. Of Vol. 5, all but six numbers, price, in sheets, $1; bound, $1,75. Of Vol. 6, all; price in sheets, $2; bound, $2,75. Of Vol. 7, all; price, in sheets, $2; bound, $2,75. Of Vol. 8, none comple, but about 30 numbers in sheets,, which will be sold at 50 cents per set; of Vol. 9, none previous to Jan. 1st, 1854.

GIVE INTELLIGIBLE DIRECTIONS—We often receive letters with money enclosed, requesting the paper sent for the amount of the enclosure, but no name of State given, and often with the name of the post-office also omitted Persons should be careful to write their names plainly when they address publishers, and to name the post-office at which they wish to receive their paper, and the State in which the post-office is located.

PATENT CLAIMS—Persons desiring the claim of any invention which has been patented within fourteen years, can obtain a copy by addressing a letter to this office, stating the name of the patentee, and enclosing $1 for fees for copying.

PATENTEES—Remember we are always willing to execute and publish engravings of your inventions, providing they are on interesting subjects, and have never appeared in any other publication. No engravings are inserted in our columns that have appeared in any other journal in this country, and we must be permitted to have the engravings executed to suit our own columns in size and style. Barely the expense of the engraving is charged by us, and the wood-cuts may be claimed by the inventor, and subsequently used to advantage in other journals.

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☞ All advertisements must be paid for before inserting.

American and Foreign Patent Agency.

IMPORTANT TO INVENTORS.—The undersigned having for several years been extensively engaged in procuring Letters Patent for new mechanical and chemical inventions, offer their services to inventors upon the most reasonable terms. All business entrusted to their charge is strictly confidential. Private consultations are held with inventors at their office from 9 A. M., until 4 P. M. Inventors, however, need not incur the expense of attending in person, as the preliminaries can all be arranged by letter. Models can be sent with safety by express, or any other convenient medium. They should not be over 1 foot square in size, if possible.

Having Agents located in the chief cities of Europe, our facilities for obtaining Foreign Patents are unequalled. This branch of our business receives the especial attention of one of the members of the firm, who is prepared to advise with inventors and manufacturers at all times, relating to Foreign Patents.

MUNN & CO., Scientific American Office,
128 Fulton street, New York.

THE NEW YORK WEEKLY SUN—Established in 1836, is the first dollar-a-year Weekly Newspaper ever published. Independent of all political parties and cliques, sustained by all the resources of the Sun Establishment in its collections of the latest news from every part of the world, ever offering something new in the way of stories and bon-mots, reports of Inventions, Prices Current, Markets, Recipes, Marriages and Deaths, etc., it is undoubtedly the best as well as the cheapest Newspaper in the world. Nearly every number of the Weekly Sun contains one or more pictorial embellishments, which, of themselves, offer a fair equivalent for the price of subscription. The postage to any place in the State of New York is only 13 cents per year; out of the State, but in the United States, 26 cents a year. For a single copy, one year, in advance, $1; club of 6 copies, $5: club of 13 copies, $10; club of 20 copies, $15. Specimen copies sent gratis when desired. MOSES S. BEACH, Publisher, corner of Nassau and Fulton sts, New York City. 19ti

IMPROVED MODE OF STRAINING SAWS—Friends Munn & Co.: I noticed an article in your paper, Vol. 9, page 108, describing a method of straining and driving reciprocating saws, by attaching the upper and lower ends of the saw to jointed arms, which are secured by pivots to arms projecting from parallel rock shafts, &c.; claimed to be invented by James Fishwick, of Lexington, Ky., who has applied for a patent. We have had the same method of straining and driving reciprocating saws in constant use for 15 years past, which was invented by David Rowley, of the town of New Lebanon, N. Y., where the same may be seen at any time in full operation Any information desired respecting the above, will be given on application to J. WOOD or E. FOWLER, New Lebanon, N. Y. 1*

1854—MICHIGAN CENTRAL R.R. LINE—D. W. WHITING, Freight Agent for R.R. and the enormous new steamers "Plymouth" and "Western World," and also General Forwarder, will forward freight of any kind, by any mode of conveyance, to any destination, with dispatch and at the lowest rates; has trucks and machinery (having been a practical machinist has all the skill necessary) for the safe and expeditious handling of any machine or heavy article, such as Locomotives, Steam Engines and Boilers, Engine Lathes, Church Bells, Safes, &c. Mark packages care "D. W. Whiting, Buffalo;" goods thus consigned take precedence with the above boats in all cases. 19tf

JOHN PARSHLEY, No. 5 and 7 Howard st., New Haven, Ct., manufacturer of Machinists' Tools, and Steam Engines, has now finishing off 25 Engine Lathes, 6 feet shears, 4 feet between centers, 15 inches swing, and weighs about 1100 lbs. These Lathes have back and screw gear, jib rest, with screw feed, and the rest is so arranged that the tool can be adjusted to any point the work may require, without unfastening the tool, hence they possess all the good qualities of the jib and the weight lathe; they are of the best workmanship. Price of Lathe with count shaft and pulleys, $155 cash. Cuts, with full description of the lathe, can be had by addressing as above, post-paid. Also four 30 horse power vertical Steam Engines with two cylinders. Price of engine with pump and heater, $800 cash. For particulars address as above. 19tf

2000 BOOKS AND PRINTS—STEARNS & CO'S Mammoth Catalogue of Books and Prints, will be sent GRATIS to all who may order it. It is invaluable as a work of reference. Postage on the Catalogue only 3 cts. Address STEARNS & CO., 17 Ann st, N. Y. 19 4*

TO PATENTEES.—Messrs. BARSTOW & WOODMAN, Attorneys and Patent Agents, No. 74 Wall st., N. Y., are prepared to aid Patentees in the introduction of their inventions into public use, or in the sale of Licenses or Rights. They attend also to prosecutions in cases of infringement. Address post-paid, as above. 19 2*

TO MACHINISTS.—Wanted, a thoroughly practical machinist, well acquainted with the most approved cotton machinery, to take charge of that department, in a large machine establishment near New York. No one need apply except he is a good manager of workmen, and can produce the best testimony as to character and ability. Address Box 131, Post Office, New York, giving name, present employment, and references. January, 1854. 18 2*

PIG IRON—The subscriber has always on hand a stock of the best brands of American and Scotch Pig Iron, for sale at the lowest market price. G. O. ROBERTSON, 135 Water st, cor. Pine, N. Y. 13 14eow

LOCOMOTIVES FOR SALE—Two Locomotives, Engines, and Tenders, made to order for five foot gauge (but which are not required at present as the road is not ready to receive them); 16 inch cylinder by 20 in. stroke; two pair drivers; one engine 6 feet diameter and the other 5 1-2 feet dia., outsider cylinders—have a large proportion of boiler, and are expected to be economical working engines. Will be sold on very favorable terms and are now ready for delivery. For further particulars apply to CHAS. W. COPELAND, No. 64 Broadway, N. Y. 17 4*

IRON DRILLS.—Portable drills for drilling iron.—They are the most simple and convenient drill in use, having a newly invented feed motion, simple and efficient in its operation. They are constructed of iron, and weigh 80 lbs. We can recommend them as a first rate article. Price $25. Address MUNN & CO., at this office.

MINING MACHINERY—Of most approved construction, furnished by FRED'K COOK & CO, Hudson Machine Works, Hudson, N. Y. 15 6m

EUROPEAN PATENTS.—MESSRS. MUNN & CO. pay especial attention to the procuring of Patents in foreign countries, and are prepared to secure patents in all nations where Patent Laws exist. We have our own special agents in the chief European cities; this enables us to communicate directly with Patent Departments, and to save much time and expense to applicants

WEIGHING AND PACKING MACHINE—This machine is particularly adapted for the weighing and packing of ground spices, coffee, teas, saleratus, cream tartar, British luster, arrowroot, drugs, prepared flour, farina, starch, cocoa, oat meal, yeast powders, seeds, snuff, ground herbs, or any like material, which may require to be put in packages, from ounces to pounds. Its advantages over the old method of packing by hand, are manifest. One of these machines will, with the aid of one person, weigh accurately, and pack neatly, from 4 to 5,000 packages per day. It requires very little power to run it, and is not liable to get out of repair. Having purchased the exclusive right to manufacture and sell throughout the United States, we are prepared to execute orders for the machines or sale of sectional rights, on reasonable terms. N. B. HARRIS & Co., Proprietors of the Excelsior Steam Spice Mills, Philadelphia, Pa. 12 13

EAGLE FOUNDRY—Steam Engine and Millwright Establishment for sale.—The subscriber offers for sale his well-known establishment on Gadsden's Wharf, Charleston, S. C., convenient to the river for steamboat work or shipping and receiving machinery, &c. The workshop, tools, patterns, &c., are in good order and calculated for the manufacture of all kinds of engines, railroad work, and machinery of every description. For terms, which will be made easy, and possession given immediately, apply to JAMES McLEISH. 15 6* Charleston, S. C.

BAKER'S IMPROVED STEAM BOILER FURnace, as used at the Crystal Palace, &c. Apply to J. AMORY, 28 State st, Boston, General Agent. 11 tf

HUDSON MACHINE WORKS and Iron Foundry—at Hudson City, N. Y., are prepared to contract for castings for railroads, bridges, buildings, gas pipes and posts, water pipe, cast-iron ornamental floors, cannon, &c. Steam engines and boilers, high and low pressure, sugar mills, Cornish lifting and forcing pumps for mines; stamps, mortars, and mining machinery;—also superior hydraulic pumps and presses, and superior machinists' tools made to order. Especial attention given to the making of patent machines. Orders by mail will receive prompt attention,

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F. COOK, H. McCLELLAND. 7 3m

C. B. HUTCHINSON'S PATENT STAVE Cutting Machines—The best in use, and applicable alike to thick and thin staves, for barrels, hogsheads, &c.; also his Head Cutting and Turning, and Stave Jointing and Crozing Machines. This machinery reduces the expense of manufacturing at least fifty per cent. For machines or territorial rights, apply to C. B. HUTCHINSON & CO., Syracuse, N. Y. 2tf

ENGINEERING.—The undersigned is prepared to furnish specifications, estimates, plans in general or detail of steamships, steamboats, propellers, high and low pressure engines, boilers and machinery of every description. Broker in steam vessels, machinery, boilers, &c. General Agent for Ashcroft's Steam and Vacuum Gauges, Allen & Noyes' Metallic, Self-adjusting Conical Packing, Faber's Water Gauge, Sewell's Salinometers, Dudgeon's Hydraulic Lifting Press, Roebling's Patent Wire Rope for hoisting and steering purposes, etc., etc.

CHARLES W. COPELAND,
7 13* Consulting Engineer, 64 Broadway.

NICHOLS' PATENT PARAGON SAFETY CANS and Glass Metallic-lined Lamps.—These beautiful glass lamps protect against breakage as well as against explosion. They are infinitely superior to all others. Orders addressed to the N. E. or Sandwich Glass Cos., Boston, Mass., will be promptly answered. 10 10*

THE NEW HAVEN MANUFACTURING CO.—New Haven, Conn., having purchased the entire right of E. Harrison's Flour and Grain Mill, for the United States and Territories, for the term of five years, are now prepared to furnish said mills at short notice. These mills are unequalled by any other mill in use, and will grind from 20 to 30 bushels per hour of fine meal, and will run 24 hours per day, without heating, as the mills are self-cooling. They weigh from 1400 to 1500 lbs., of the best French burr stone, 30 inches in diameter; snugly packed in a cast-iron frame, price of mill $200, packing $5. Terms cash. Further particulars can be had by addressing as above, post-paid, or to S. C. HILLS, agent N. H. M. Co., 12 Platt st., N. Y. 5 tf

NEW HAVEN MANUFACTURING COMPANY—Tool Builders, New Haven, Conn., (successors to Scranton & Parshley) have now on hand $25,000 worth of Machinists' Tools, consisting of power planers, to plane from 5 to 12 feet; slide lathes from 6 to 18 feet long; 3 size hand lathes, with or without shears; counter shafts to fit all sizes and kinds of universal chuck gear cutting engines; drill presses, index plates, bolt cutters, and 3 size slide rests. The Company are also manufacturing steam engines. All of the above tools are of the best quality, and are for sale at 25 per cent. less than any other tools in the market. Cuts and list of prices can be had by addressing as above, post-paid. Warehouse No. 12 Platt st., New York, S. C. HILLS, Agent N. H. Manufacturing Co. 5tf

PLANING, TONGUING, AND GROOVING—BEARDSLEE'S PATENT.—Practical operation of these Machines throughout every portion of the United States, in working all kinds of wood, has proved them to be superior to any and all others. The work they produce cannot be equalled by the hand plane. They work from 100 to 200 feet, lineal measure, per minute. One machine has planed over twenty millions of feet during the last two years, another more than twelve millions of of feet Spruce flooring in ten months.. Working models can be seen at the Crystal Palace, where further information can be obtained, or of the patentee at Albany, N. Y 1 tf GEO. W. BEARDSLEE.

A. B. ELY, Counsellor at Law, 52 Washington street, Boston, will give particular attention to Patent Cases. Refers to Messrs Munn & Co., Scientific American 16tf

LEONARD'S MACHINERY DEPOT, 109, Pearl st., and 60 Beeaver, N. Y.—Leather Banding Manufactory, N. Y.—Machinist's Tools, a large assortment from the "Lowell Machine Shop," and other celebrated makers. Also, a general supply of mechanics' and manufacturers' articles, and a superior quality of oak-tanned Leather Belting. P. A. LEONARD. 1tf

LOGAN, VAIL & CO., No. 9 Gold st., New York.—Agency for Geo. Vail & Co., Speedwell Iron Works, Morristown, N. J., furnish and keep on hand Portable Steam Engines of various sizes, Saw and Grist Mill Irons Hotchkiss's Water Wheels, Iron Water Wheels of any size, Portable Saw Mills, complete; Bogardus's celebrated Planetary Horse Powers; heaving forgings and castings for steamboats and rolling mills, Ratchet Drills of superior quality for machinists, Saw Gummers, Hand Drills. Tyre Benders, and shafting and machinery generally. 39 1y

McALLISTER & BROTHER.—Opticians and dealers in mathematical instruments, 48 Chesnut st., Philadelphia, Pa. Mathematical instruments separate and in cases, Protractors, Spacing Dividers, Drawing Pens, Ivory Scales, Tape Measures, Salometers, Spy Glasses, Microscopes, Hydrometers, &c., &c. An illustrated and priced catalogue will be sent by mail free of charge. 40 6m*

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MECHANICAL DRAWINGS—J. H. BAILEY, Mechanical or Architectural Drawings executed in all kinds of perspective. Office Tryon Row, No. 5, opposite the City Hall. 16 4*

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Scientific Museum.

Elevated Promenade and Railroad for Broadway.

Numerous plans have been presented to the public within a short time past for an elevated railroad in Broadway, several of these we have illustrated for our readers. There is evidently a necessity for something of this kind, or so much interest would not have been manifested in the matter by the public. We once more present illustrations of a plan of this kind devised by J. B. Wickersham, the well-known iron railing manufacturer of this city. Of these figure 1 is a perspective view; figure 2 a transverse section; figure 3 is a side view of the supporting columns, and figure 4 a front elevation of a portion of the road. The letters in each refer to corresponding parts.

In this plan it is proposed to build a railroad on a level with an additional sidewalk, to be supported over the present one by the columns, A A. From these columns spring longitudinal braces, B, and transverse braces, C, for the more perfect support of the elevated structure. The railroad will be connected at the termini, one of which is to be at the battery and the other at the Crystal Palace, thus forming a continuous track, and it is proposed that in summer the down travel shall be on the east side, and the up travel on the west side, so as to secure a shady side to the majority of passengers, while in winter this order will be reversed.

This terrace with its columns and supports are to be made of iron, the sidewalks above to be formed of flag stones resting on woven iron gratings supported by beams bound firmly together at the columns, the roof of the lower side walk will be made of corrugated iron forming gutters on its upper surface for the passage of such water as oozes between the flag stones to the main canal, through which it is led off through the columns to the lower gutter.—This corrugated iron can be so laid as to be perfectly water tight.

The cars are intended to be run on the outside of the upper terrace, directly over the line of iron columns, so that the entire weight will be supported by them, thus relieving of all pressure from the weight of the cars, the entire structure where it is connected to the building. The cars are to be drawn by horses until some better plan shall be devised. The rails are to be laid on india rubber supported on wooden sills to remove the noise and jar. A substantial iron railing will inclose the track, with occasional openings from the promenade to admit passengers.

Street crossings are to be placed at suitable intervals, and at the most crowded thoroughfares, and stairways are to be arranged in the inside of the buildings for passing from the lower to the upper side-walk. The hight of the terrace is to be about sixteen feet, so as to coincide as nearly as possible with the hight of the lower story of buildings of modern construction.

As will be readily perceived, the value of the property in the second stories will be greatly enhanced, indeed, it will be nearly equal to the first story. The proposer of this plan calculates that this additional value will amount to fifty million dollars.

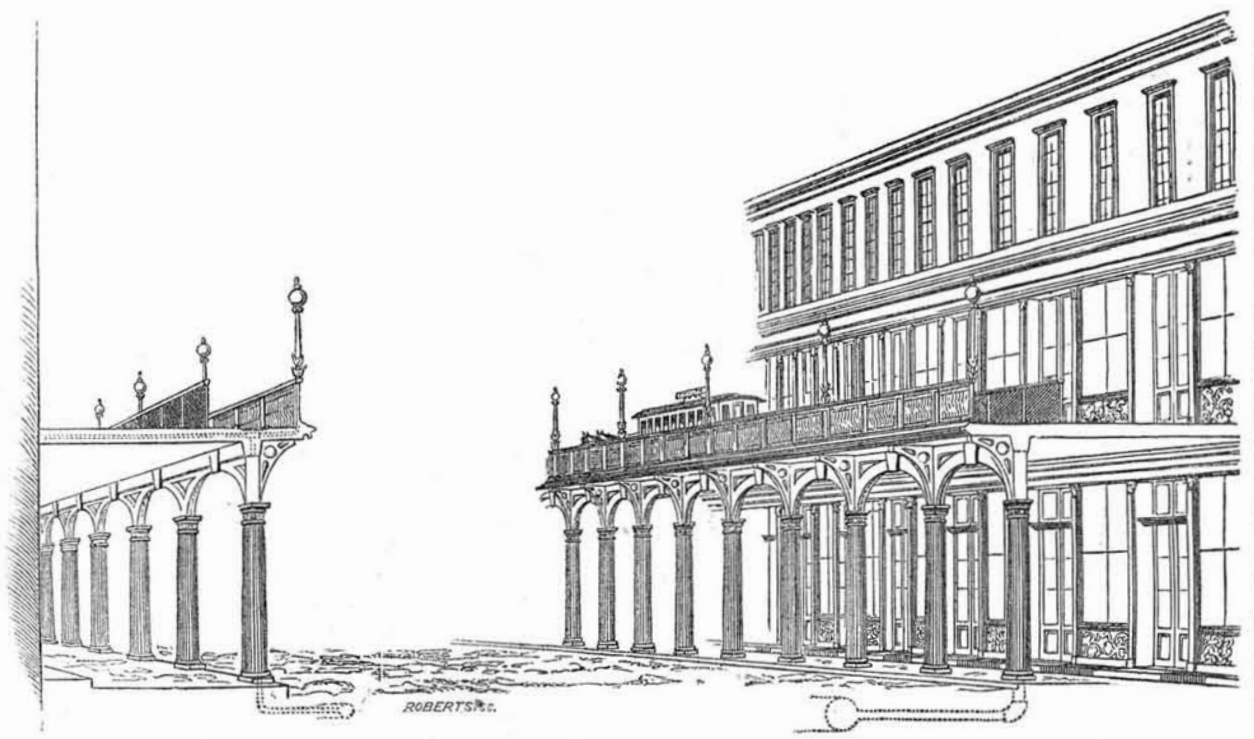
We have carefully examined this plan and can commend it to our readers, it seems feasible, and we believe that no good reasons can be urged against it. It is certainly in every way preferable to any plan we have before illustrated and described. J. B. Wickersham, manufacturer of iron railing, furniture, &c., 312 Broadway, N. Y., is the proper person to be consulted in the above matter.

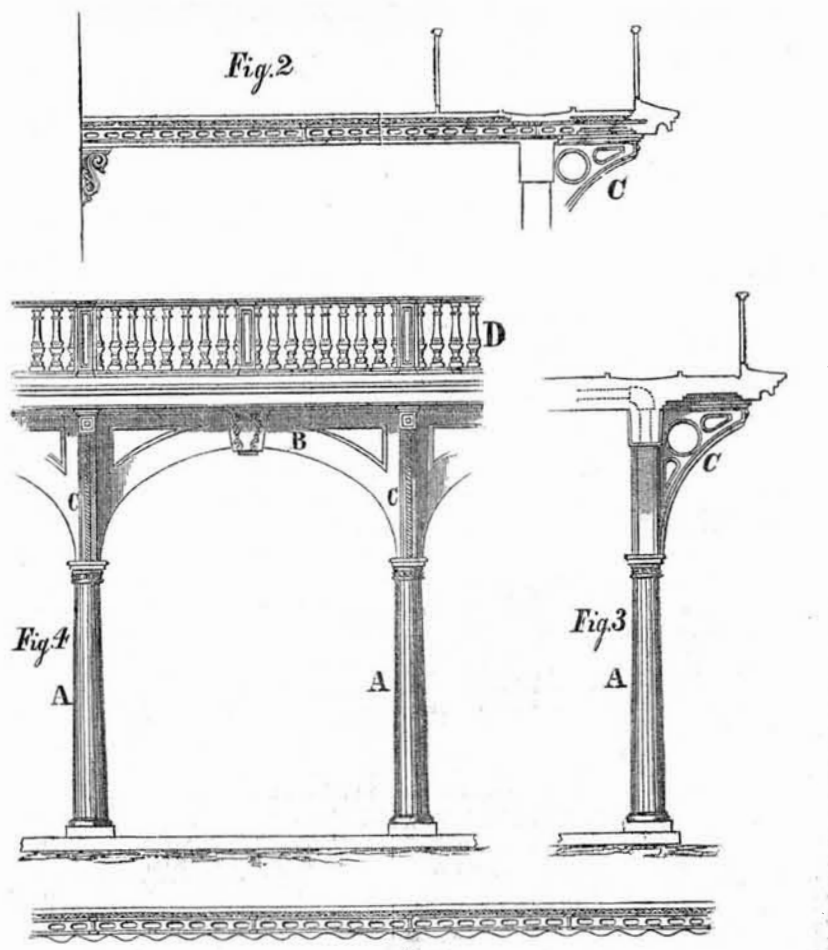
Central Elevated Railway.—Charles Mettam, of this city, proposes to construct a central railway in Broadway, which will obviate any objection urged against the use of the sidewalks. The plan is to erect a line of strong iron pillars in the very center of the street, and suspend a railway on these, from arms branching out at the top, from a strong hub. One set of cars will go up on one side of the line of posts, and the other set come down on the other side. A spiral stair occupying but a small space will wind round the post placed near to a crossing, and by this means passengers will ascend to the cars. The cars will run sufficiently high above the street to allow carriages to pass below them and leave all the street free, except where the posts are erected. The method of propulsion proposed is a screw shaft working in a large nut wheel, and the power to be employed stationary engines.

O'Neil's Arcade Railway.—Perhaps the grandest scheme for an elevated railroad in Broadway is that of P. O'Neil, of the Navy Yard, Brooklyn. He proposes to erect a grand arcade above the street, and an elevated railroad to be propelled by stationary engines, and an endless wire rope—in short, to construct an elevated railroad, and upper suspended promenades, so as to enable Broadway to have the advantage of a double street. His models and plans are in the Crystal Palace, and they deserve attention.

It is difficult for us to remember all the plans which have been presented to us for elevated railroads on Broadway during the past eight years, and yet there seems to be a no nearer approach of seeing one erected now than when the first one was proposed. The owners of property claim to have privileges of a private character over the sidewalks, which are all vaulted and occupied below, and unless there is some prospect of obtaining their sanction for an elevated railway above the street, there is no use of prosecuting the subject, and overloading it with such a diversity of projects. We would advise those who have expended so much ingenuity on this subject, not to let it interrupt their business, or divert their minds too far from prosecuting other researches, and making improvements in other branches of the arts.

WICKERSHAM'S RAILROAD FOR BROADWAY.---Figure 1.





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The following bill is now pending before the Georgia House of Representatives; it is entitled "A Bill for the Protection of Certain Cases of Planters and Cotton Sellers within the State of Georgia."

"Sec. 1. Be it enacted, &c., That from and after the passage of this act, cotton sold by planters and commission merchants shall not be considered as the property of the buyer, or the ownership given up, until the same shall be fully paid for, although it may have been delivered into the possession of the buyer, any law, usage, or custom to the contrary notwithstanding.

Sec. 2. And be it further enacted, That any person engaged in the business of buying cotton, either on his own account or for others, who shall buy or engage to buy cotton from a commission merchant, and shall fail or refuse to pay for the same at the time agreed on, or if no time shall have been specified, then, when required, and shall make away with, or dispose of any cotton purchased and not paid for, shall be deemed guilty of fraud and embezzlement, and shall be liable, on conviction, to be imprisoned in the Penitentiary, not less than one nor more than five years, at the discretion of the jury trying the case.

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